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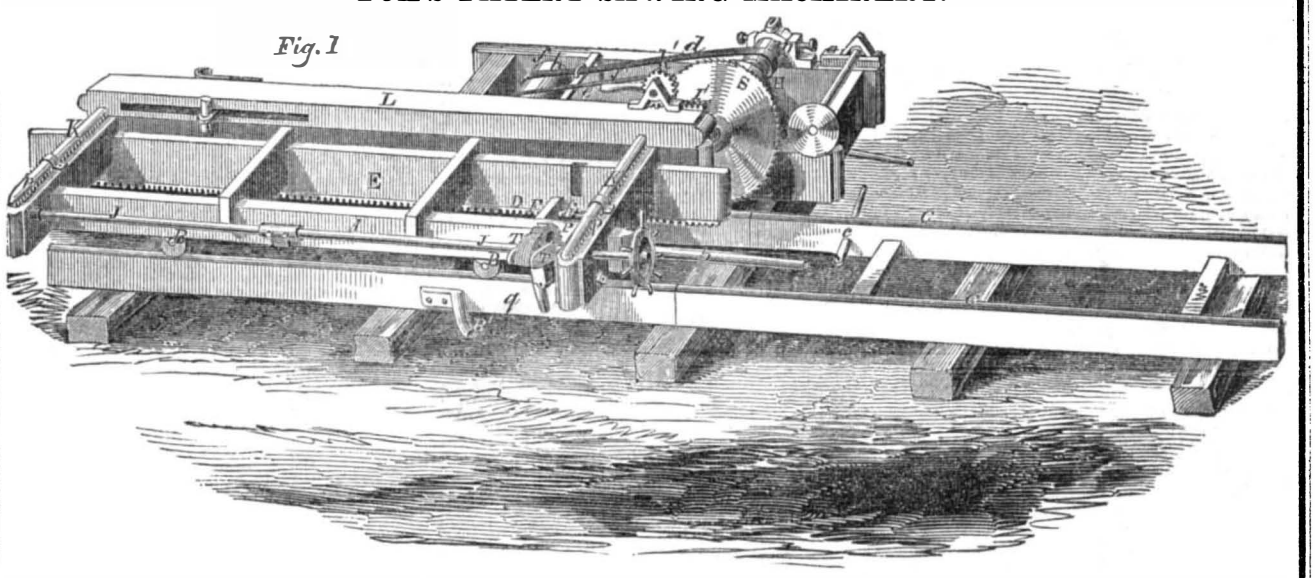
FOX'S PATENT SAWING MACHINERY.

Fig. 1



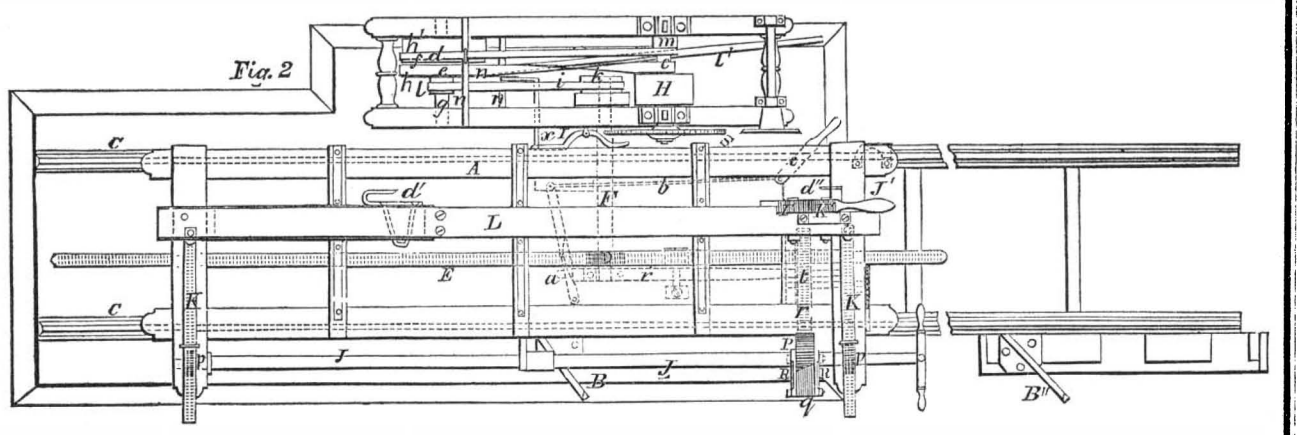
Sawing Machinery.

The accompanying engravings are a perspective view (fig. 1,) and a plan view (fig. 2,) of the improved patent sawing machinery of Charles R. Fox, of Chicago, Ill. The object of the invention is to furnish the means of giving any desired set to the log, and also to furnish a sure and simple set off for the carriage in gigging back, and a set off when moving forward, and consists of two parts. The first consists in the employment of a pair of arms movable around the feed rod, the lower arm jointed to accommodate the back motion of the carriage, and the upper arm carrying a sectional pawl with an oblique edge, so that some one of the sections will always catch in the ratchet moving the feed rod, the position of the lower arm being dependent upon the protrusion of a regulating rack, against which the arm rests; the advance or recedance of the rack determines the extent of surface of an inclined stud to be passed over by the lower arm, and the amount of movement given to the ratchet revolving the feed rod. The second part of the invention consists in placing under the carriage, roller boxes for the rollers carrying the carriage, the said boxes having inclined interior faces, and constructed for giving the carriage a lateral movement at its backward and forward motion, sufficient to clear the saw in gigging back, and insure a proper position for receiving the cut when moving forward. The machinery is so constructed as to cut by both the backward and forward motion, or to cut by the forward movement only and gig back for the succeeding cut, for which purpose the second part of the invention is employed.

A is the log carriage frame, and B its wheels moving on rails, C. The carriage is moved by pinion, D, which meshes into the rack, E, on shaft, F. This pinion is raised and lowered, and thrown in and out of gear, by the wedge lever, *a*, a rod, *b*, and lever, *c*. S is a circular saw secured upon a shaft in the common way. It is driven by a band round pulley, H, from a pulley in the shaft of a steam engine or water wheel. The shaft, F, receives motion by the band, *d* or *e*, passing from the saw shaft pulley round the pulley *f*, on shaft, *g*, which has also two other pulleys, *h* and *h'*, on it, for receiving one of the bands, *d* and *e*, when the other is in operation. The band, *d*, is straight, the other, *e*, crossed, so as to rotate the shaft, *g*, in contrary directions, the crossed band, *e*, giving the log carriage, A, its forward motion—(by the band, *i*, which passes over pulleys *l k*, on shaft F, carrying pinion D, which meshes into the rack on the carriage)—the straight band, *d*, gives it the backward motion. These bands, *d e*, operate the log carriage with the same velocity, for the saw to cut during both the forward and backward movements of the log carriage. When it is designed for the saw to cut during the forward motion only, the pulley, *m*, is employed to gig the carriage backward with an increased velocity. The bands, *d e*, pass through a slide, *n*, which is moved longitudinally by being connected with lever I, which is acted upon by studs on the carriage. This movement of the slide, *n*, causes one of the bands, *d* or *e*, to pass from the fixed pulley, *f*, to one of the loose pulleys, and the other band to pass from a loose pulley to pulley *f*, according to the slide's direction, which reverses the motion of the saw carriage without stoppage.

J is a feed rod on the outer side of the carriage; it has pinions, *p*, on its extremities, meshing into racks, K, attached to the head block, L. The revolution of rod J, gives lateral motion to the head block and feeds the log. It is the mode of giving the requisite amount of revolution to rod J, which constitutes the first part of the invention. Upon this rod, J, is the ratchet wheel, P, embracing which, and movable around the said rod, are arms, R and T, the latter shown in fig. 1 and the former in fig. 2. The former (R_2) contains the sectional pawl, *q*, the oblique edge of which rests upon ratchet P, which is jointed to fold under the carriage when it meets with any obstruction during the backward movement of the carriage, but it is incapable of yielding during the forward motion. When therefore the carriage is moving, and one of the fixed inclined studs, B' or B'', on the permanent way, is met, an outward and upward movement is given to the arm, T, and the rotation of the ratchet wheel, P, by the action of the pawl, *q*, in one of the notches of the wheel. The amount of this upward and outward movement of arm, T, is governed by the extent of the surface of the stud, B' or B'', to be passed over, which will be greater or less, in proportion to the distance of the arm, T, from the side of the carriage at the time of striking the stud. This adjustment is regulated by the position of the rack, *r*, against the end of which the arm, T, rests, said rack meshing into pinion, *t*, and is moved by a plate wheel (not seen) which has graduated notches on its edges, into which a pawl takes, and moves it round one notch for each proper feed of the log. On the shaft of said graduated plate wheel is a pinion gearing into a cross rack, which moves the head block to give the proper log feed. The inclined studs are placed in the proper position for giving the requisite amount of feed motion during the movement of the carriage. The one, B'', is movable to accommodate logs of different lengths, and is removed when the mill is adjusted to saw by the forward motion of the carriage only. Studs (not shown) on the inner side of the carriage strike lever I, and operate slide *i*, to change the bands on the pulleys for giving the backward and forward motion of the carriage. The log is held between the dogs, *d'* and *d''*, the one secured to the block, L, and the other to rack, I', and is movable longitudinally by lever J', through the pinion, K'.

Fig. 2



OPERATION—The log is first secured between the dogs, *d'* and *d''*, and the bands, *d* and *e*, arranged for either the single or double cut of the saw—backward and forward movements of the carriage; the stud for the single movement being removed, and the double movement set to suit the length of log. The gauge plate wheel to gauge the feed of the log, is also properly set, so that the proper thickness of plank or board shall be cut at every movement of the carriage by the rotation of the feed rod, J. Motion is given to the saw shaft, and the carriage with the log on it is fed towards the saw as has been described, and as soon as the first cut is completed, the arm, T, strikes the stud, B'', the feed rod, J, is rotated, and the log fed over towards the saw the proper distance to cut a second board or plank by the return movement of the carriage. To give the back movement to the carriage, a rear stud, not shown on its inner side, strikes the lever, I, and shifts band *d*, to pulley *f*, which throws off band, *e*, to the loose pulley, *h*, producing an immediate reverse motion of the log carriage, A, and the cutting out of a new board or plank. When this back cut is completed, the forward stud (not shown) on the inner side of the carriage strikes the arm, *x*, of lever, I, again reversing the positions of the bands, *d* and *e*, on the fast and loose pulleys on shaft *g*, and thus again gives a forward motion to the carriage, and so on continuously until the log is sawn up. It will be observed that the studs, B' B'', operating arm T, feed the log towards the saw for every new cut, by moving transversely the head block of the carriage. The studs on the inner side of the carriage are for shifting the bands to reverse the carriage, by a common principle carried out in many other machines.

To cut with the forward movement only of the carriage, the journals, B, of the rollers, are peculiarly set in boxes, and as they move forward they run up an inclined plane, and set the carriage up for the cut, while on the return, for gigging back the carriage, the journals run to the opposite extremity of the box, and press against another inclined plane, and move the carriage sufficiently from the same to admit of its running rapidly back without interference with the saw. Stud B'' is not used is this case. Pulley *m* is employed for gigging back. The boxes of the journals, to produce the effect stated, may be considered self-acting, because they produce the lateral movement of the carriage by its motions. The operator can stop the carriage by lever *l'*, which will move the slide, *n*, and by the action of lever, *e*, make pinion D, drop clear of the rack.

He can also move the head block by the lever wheel at the nigh side, to take on a new log. This is a self-feeding, double and single acting saw mill, simple in its parts and operations.—A patent was granted for it on May 9th, last year, but it has never before been brought before the public. Two claims are embraced in the patent, one for the method of feeding by the double cut movement, and the other for the method of giving the requisite set off to the carriage when gigging back, and again setting up when moving forward for the cut by means of the journal boxes of the rollers, B. Every improvement in sawing machinery is of great importance to our country.

More information respecting it may be obtained by letter addressed to the patentee, at Chicago, Ill.

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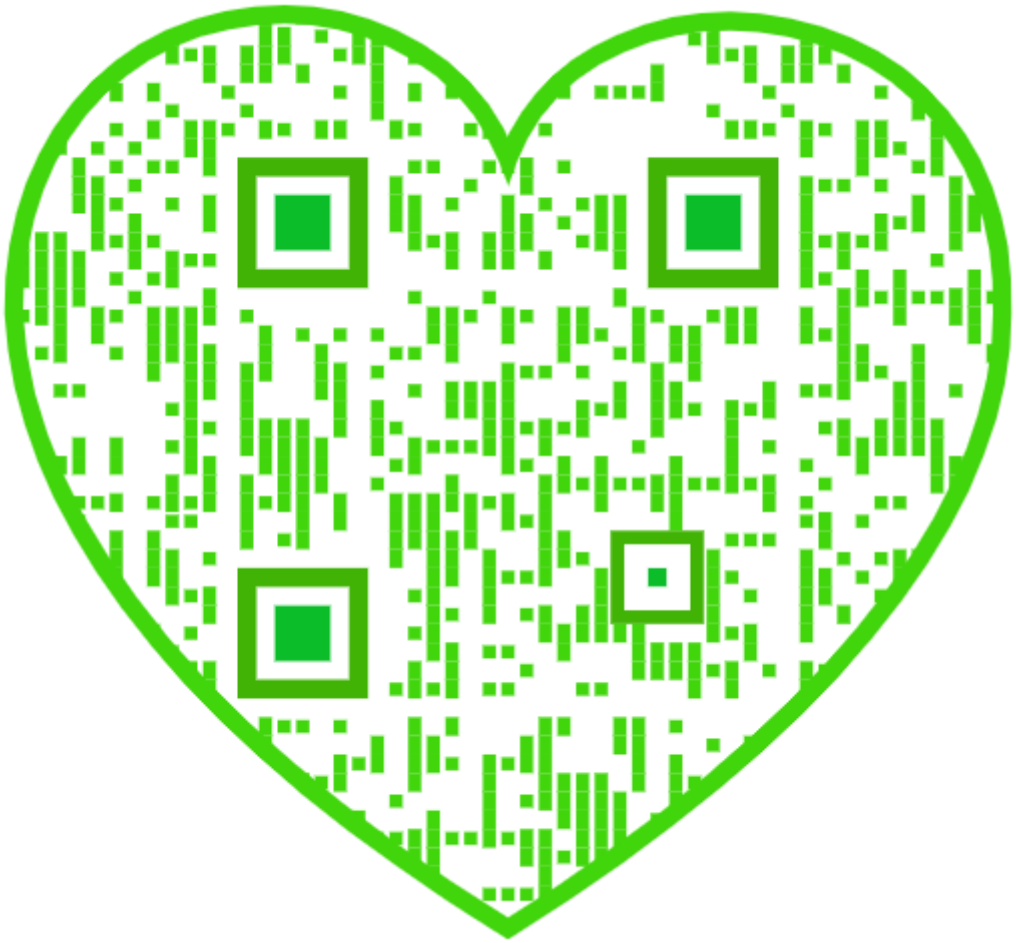

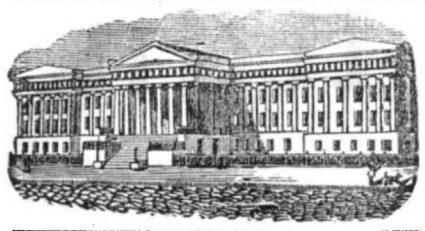

[Reported Officially for the Scientific American.]

LIST OF PATENT CLAIMS

Issued from the United States Patent Office,

FOR THE WEEK ENDING AUG. 21, 1855.

CANDLESTICKS—C. W. Blakeslee, of Northfield, Ct.: I do not claim forming the body and base of the candlestick of wire; neither do I claim a spring lamp or socket, in itself considered, or independently of the mode of constructing or forming the same, as shown, for they have been previously used.

I claim extending the wires of the body of the candlestick, through a dish-shaped plate, B, substantially as shown, for the purpose of forming a spring socket for the reception of the candle, as described.

[In these days of progress and new inventions, one would think it a rather difficult matter to introduce novelty enough into a candle stick to warrant the issue of letters patent. Mr. Blakeslee, however, shows that all new ideas are not yet exhausted: his improvement consists in making the entire candlestick of wire. It commences with a flat coil at the base, and rises in spiral form, the upper part terminating with a socket of simple but peculiar construction for the reception of the candle. Four upright wires are arranged on a disk, their upper ends springing together slightly; the candle is placed between the wires and thus securely held. A candlestick thus constructed is light, strong, cheap, and very ornamental in appearance.]

APPLICATION OF THE CONICAL PENDULUM TO TIME-KEEPERS—J. C. Briggs, of Concord, N. H.: I claim the application to clocks, time-pieces, or other machinery, as a regulator of a rotary or conical pendulum, the rod of which is flexible, and attached at its upper end to a fixed point above, and without the described cone, and extending only below the point of support, the pendulum to be kept in motion by a spindle coming up from below, substantially as described.

SEALING CANS—Wm. Burnet, of Cincinnati, Ohio: I claim the use of a clamp cap, B, constructed substantially as described, for the purpose of closing the opening in the can, between the filling and the final sealing thereof.

[The fact is coming to be pretty well known, that many of the fruits and choice kinds of small vegetables can be easily preserved in a fresh state, retaining all their original flavor for any length of time by merely keeping them in an air-tight vessel, The result is, that a very large demand for such preserved fruits is springing up, and as the chief expense, beyond the cost of the fruit, is in the can, it is highly desirable to have some ready means of opening and closing the mouth of the same, always leaving it air-tight. The old plan was to fill the can and then solder on the top. But such vessels are a nuisance to get open, and have been very properly discarded. Mr. Burnett appears to have made an excellent improvement; he clips and slightly bends the edge of the opening in the top of the can, and uses a cover having little projections which fit the clips, You turn the cover a little and it screws on tight; turn it the other way and it comes off.—The edges of the cover rest in a groove, and are sealed by wax, which is poured into the grooves at the time of filling the cans. It will be observed that this can, while it presents to the dealer the desirable quality of great cheapness, is also highly convenient to the purchaser. It is a good invention.

OBSTETRICAL EXTRACTOR—A. C. Buffum, of Chicago, Ill.: I claim an obstetrical extractor, which, from the peculiar form of its fingers, and by means of three cross-bands interlaced by down straps, so clasps and supports the head of the child, as that the force necessary to assist its delivery can be applied without injury to mother or child.

I also claim that by means of the frustra, the instrument can be ready for application, so small and of such shape, that it can be applied more readily and with less risk and pain to the patient than any forceps or other extractor in use.

GLASS JOURNAL BOX—Edward Campbell, of Columbus, Ohio: I do not claim the union of glass and iron, whilst the former is in a plastic state, and the latter at a red heat, by pressure, to produce a welding of the two.

But I claim, as a new manutacture, a journal box composed of an iron body and an anti-friction lining surface of glass, when the said glass lining is combined with its iron back, as set forth.

SWIMMING GLOVE—Dugald Campbell, of New York City: I claim the use or employment of flexible webs uniting the thumbs and fingers of gloves.

[Nothing now remains to render man an aquatic animal except the invention of some web-apparatus for his feet: if his toes could be slitted up and so made longer Mr. Campbell's apparatus would be applicable.]

WRENCH—J. D. Dale, of Philadelphia, Pa.: First, I claim the combination of the reversible flanged and winged hub, F, and pawls, G G', with the upper and lower ratchet wheels, B1 B2, constructed and operated as described.

Second, I also blaim the combination of the angular jaws and worm plate, F, or their equivalents, with the upper and lower ratchet wheels, B1 B2, and the mechanism giving them a continuous motion either to the right or left.

BASIN STOP COCK—Henry Eling, of New York City: I do not claim closing a cock by means of a spring, when said cock is not provided with a screw valve.

But I claim making the cap, C, independent of the nut, D, so that by simply loosening the nut, the cap may be turned and the valve adjusted.

[In city dwelling houses, where water is conveyed about through the apartments in pipes, it is usual to furnish the wash basins with stop-cocks, the handles of which are hollow, and so arranged that when you pull the handle forward, the water discharges through it into the basin, and when you push it back the liquid ceases to flow. These stop-cocks, although ornamental and exceedingly convenient, possess, nevertheless, some defects: for example, the children love to play with them, and sometimes leave them turned so that the water overflows and damages the house and furniture; then again, a careless servant does the same thing. Sometimes, too, the valve gets out of kilter and leaks, or lets the water run when the handle is in the wrong position. Mr. Eling easily obviates all these troubles, and renders this kind of stop-cock what it ought to have been long ago—a complete article. He prevents the possibility of a careless overflow, by arranging a self-acting spring within the stop-cock, in such a manner that the water will run so long as you hold the handle in proper position; but the moment you let go, it flies back, and the water stops. The other portions of the improvement, it is needless for us to deseribe; suffice it to say, that they perform their offices effectually. This is an excellent improvement; it will be appreciated by all householders and housekeepers.]

PRESSURE WATER WHEEL—Wm. Fields & S. Gerhard, of Wilmington, Del.: We claim the combination of the valve, B, with the buckets, A, upon the wheel, D, revolving in the case, C, substantially as described.

PUMPS—S. H. Gray, of Bridgeport, Conn.: I do not claim operating the two pistons of a single cylinder, double acting pump, by means of two racks and a pinion, when said racks and pinion are arranged above the top or below the bottom piston, and the rod of one piston passed through the rod of the other.

But I claim the employment and arrangemcnt of the rod, C C', and pinion, D, combined between the pistons.

[In this pump two pistons are employed in one cylinder, both operated by one handle or lever. The improvement consists in a novel means of operating the pistons. A shaft passes transversely through the center of the pump barrel, within which, on the shaft, a cogged pinion wheel is placed. The piston rods have teeth on them, like a rack, and gear with the pinion. Outside of the pump, and attached to one end of the shaft, there is a handle or lever, by working which back and forth, the pistons are operated. No piston rod, it will be noted, is seen on the outside, since all the moving parts, except the lever, are confined inside of the pump. By the use of this invention two separate streams of water can be discharged, if desirable, or a single continuous one. It is, in effect, the combination of two of the ordinary pumps into one apparatus, at a cost which exceeds only by a trifle the expense of the single pump. The prominent advantagess are, doubling the capacity, and therefore the utility, without much increasing the cost. This invention is simple in its parts, and not likely to get out of order. We regard the patent as one of value.]

HEMP CUTTERS—J. L. Hardman, of Arrow Rock, Mo.: I claim, first, the side reel constructed and applied for hemp, grain, or other articles of like nature, such reel having curved arms, be the curvature more or less.

Second, I claim the cleaning shears, substantially as described.

BRIDGES—H. L. Hervey, of Quincy, Ill., and R. E. Osborn, of Springfield, O.: We claim the arrangement of the blocks, D D, and posts, O O, in combination with the adjustable suspension truss, the arched truss, and the tension cord, so that the camber of the bridge may be increased or diminished by the adjustment of these blocks, in connection with the tension cord, so as to increase the strength of the bridge, by lessening the strain on any one point, by distributing it to many points, by means of the adjustable blocks, as described.

Second, we claim constructing and arranging the blocks which sustain the tension braces of the suspension truss, so that they will slide or traverse on the string pieces, so that they will slide or traverse on the string pieces, so as to equalize, distribute and proportion the load more uniformly, and over a larger portion of the bridge.

Third, we claim supporting the floor timbers alternately, by or successively by the arch and suspension trusses, as set forth.

[This is a very valuable patent: a bridge of this construction will be stronger, and yet cheaper, than many of those now in general use. The inventors are ingenious men.]

ENGRAVING CALICO PRINTERS ROLLERS—John and Thomas Hope, of Providence, R. I.: We claim the combination and arrangement of the two sets of measuring markers, i i i i, the hoid back rods, F F, and roller, with plane surface table, the same being not only to enable the design to be transferred, it being brought forward in regular sections, but to be maintained flatly upon the table.

We also claim the two measuring indices, in combination with the large pulley and the shaft of the driving roller of the cylinder to be engraved.

We also claim the means of holding and moving the cylinder, so that it shall not only be rotated, by pressure, against its external surface, but may be readily, either removed from or applied to its supports, the same consisting is employing a driving roller and a bearing roller, at one end of the cylinder, in combination with two sets of bearing rollers, made to extend into a groove, around the cylinder, and to support such cylinder, both laterally and longitudinally.

We also claim the arrangement of the pattern table, the tracer and its carriage, the several other carriages, the mechanism for operating each, the wheel, the shafts, and the supports of the roller to be engraved—the whole constituting an improvement in engraving machinery and securing to it important advantages in operation, as well as in construction, as set forth.

[The above is a very important invention; the beautiful figures and designs which ornament almost every species of calico sold in our stores, are produced by passing the white cotton cloth between solid cylinders or rollers made of copper, the surface of these rollers being engraved and inked over by other rollers, as fast as the cloth passes along. The result is the production upon the cloth, of various patterns and figures in different colors, just as books, newspapers, and the like are printed. The preparation of the cylinders, in calico printing, where an entirely new design is wanted, is a slow and costly matter, each cylinder sometimes costing as high as three or four hundred dollars. The improvement of Messrs. Hope is calculated to facilitate and cheapen the cost of the printing rollers.—The patent appears to be a valuable one.]

APPARATUS FOR VESSELS TO INDICATE THEIR LOCALITY WHEN THEY SINK, AND TO SUPPLY A MEANS OF RAISING THEM—J. Hyde, of New York City: I am aware that on some occasions, in throwing guns, anchors, and other heavy articles overboard, to lighten ships at sea, cords with floats have been previously attached, to indicate their locality when sunken.

But I am not aware that buoys, specially provided, have ever been arranged and connected with a vessel, or any thing within it, so as to remain so connected and give out the connecting cord, to remain on the surface of the water as the vessel sinks, to indicate its locality, and afford the means of forming the necessary connection for raising the vessel, &c., to the surface; and therefore I do not claim, broadly the use of floats to indicate the locality of sunken vessels.

I do not wish to be understood as limiting myself to the special construction of the buoys; nor to the special manner of arranging the cord which forms the connection between the buoy and the socket, or the hose; nor to the special mode of attaching the socket to the vessel or safe; nor to the mode of making the flexible bags, or cammels and hose; nor to the special construction of the grapple, as all these may be varied without changing the character of my invention.

I claim the mode of operation, for indicating the locality of sunken vessels, by means of a buoy or buoys, connected and combined with the vessel, by means of a cord or cords, or the equivalent therefor, attached to the buoy and a windlass or equivalent thereof, and connected with the vessel, or some valuable within the same.

I also claim the mode of operation, for connecting cables or chains, with sunken vessels or articles therein, by means of the socket, or any equivalent therefor, operated by the buoy cord, substantially in the manner described.

RAILROAD CAR SEATS—Ebenezer Jeffers, of Dorchester, Mass.: I am aware that a chair seat has been so combined with its legs, or supporting frame, as to be capable of being rotated horizontally. I am also aware that it is not uncommon to apply a table or other article to a stand, by such devices as will admit of its being moved in either a horizontal or vertical direction. I therefore do not claim such.

But I claim arranging the pedal, the bolt, and their locking recesses together and in the sector, and in the turning and stationary posts, as described, and so that by one single movement of the pedal, the sector and the turning post may be latched or unlatched simultaneously, so as to enable the chair to be operated.

JOURNAL BOX ALLOYS—B. F. Lawton, M. D., of Troy, N. Y.: I claim the aforesaid alloy, or box metal, as a new material, for the purpose of forming boxes, journals, axles, and all other rubbing surfaces of the moving parts of machinery, as described.

PRESSURE GAUGES—Jno, Matthews, Jr., of New York City: I claim the construction of a gauge tube, in the manner set forth, that is to say, having offsetts thrown out along one side, for the purpose substantially as described.

WARM BATH APPARATUS—L. H. Lefebre, of New Orleans, La.: I claim the portable steam bath apparatus composed of a double generator, so arranged that the products generated in the two compartments may be conveyed to the bath, mingled or separately, of a bag, M, and of a connecting pipe, K, each of said parts constructed and arranged as described.

PERCUSSION PROJECTILES—Augustus McBurth, of Elizabeth, N. J.: I claim the improvement in bomb shells, or missiles, having four arms, b b' b'' b''', and eight flutes, with sharp edges, 1, 2, 3, fig. 3, in the manner and for the purpose substantially as described, also a rod to pass through the shell, in a longitudinal course, for the purpose set forth.

And also a hammer with a flat spring attached, together with a spiral spring, d, as shown and described.

[Here is another Sebastopol taker. It appears to be a good invention: it is apparently so arranged that the moment the shell strikes an object it explodes its magazine of powder, and scatters death and destruction all around. Common bomb shells carry such a magazine within, and when the fuse, which is lighted by the act of discharge, burns down to the powder, it explodes. Sometimes the explosion takes place in the air before the shell reaches its destination, and then the result is harmless. Oftener the fuse in the shell burns for some time after landing, and the enemy have time to run away from the shot and escape injury. Mr. McBurth's shell explodes when it strikes, and then so instantaneously that escape is out of the question.]

HAND STAMP—S. P. Ruggles, of Boston, Mass.: I claim in a hand stamp the connecting of an electrotype plate to the handle of the stamp, by means of a screw cap, as described, for the purpose of facilitating the removing and replacing of the electrotype, or portions thereof, as set forth.

I also claim the combination of devices for holding the bed plate, E, to the shank, B, so as to preserve the ball and socket, or yielding point, prevent them from being separated, and to keep the coiled spring in place—the same consisting of the flanges, a f, on the bed plate, with the holes therein, the large opening, c, in the shank piece, and the pin, e, passing respectively through them, as set forth and described.

[Mr. Ruggles is a veteran inventor in the field of printing mechanism. His improvements are in use in almost every printing office in the country.]

WINDOW SHADES—J. J. Crooke, of New York City I claim so constructing and hanging a window shade, that the roller thereof shall be capable of being raised and lowered, and at the same time, shall roll or unroll the shade, and this without interfering with the fixtures for raising the bottom of the shade, in the ordinary manner, as described.

RAILROAD CAR SEATS—A. M. Smith, of Rochester, N. Y.: I do not claim the form or shape of the back or seat part of the car seat, as they are in common use.

But I claim the constructing and arranging of the car seat, so that the whole back of sufficient width and shape best adapted to support the body of a person for day riding if changed either side of the seat, to ride either way, can be reversed, the outside turned inside thereby, and at the same time raised high enough to support the head and body equally well for night riding, by means of and in combination with the different devices, or their equivalents, necessary for the purpose, as described and set forth.

HORSE YOKES—Jno. Woodward, of Wilmot Flat, N.H.: I do not claim a horse yoke, consisting of two eveners or horizontal bars, a connecting or vertical bar, two sets of harness and hame connections, arranged at the upper and lower ends of the harness, such being represented in the patent of Elijah H. Dantforth, granted July 23, 1853.

I slaim constructing and arranging the hame connections with respect to a single beam, whereby such hame connections may be attached to the middle of the hames instead of at their ends, and thereby render but one bar or bearer necessary to connect the harness and the pole of a carriage.

DOOR KNOB—A. E. Young, of Dorcester, Mass, (assignor to himself and Mark Worthley, of Boston, Mass.:) I claim the sliding clutch and its attachments applied to the shank and the socket and the movable knob, as set forth.

BREECH-LOADING MAGAZINE FIRE ARMS—J. Swyney, of Charlestown, Mass. (assignor to himself and James Dandridge, of Boston, Mass.): I claim the carrier, R, its spring, S, in combination with the magazine or tube, F, for the purpose of bringing a cap from the magazine, E, downwards, or into line with the rammer, as described.

I also claim the rammer, in combination with the rammer, F, and the mechanism by which they are connected so as to operate together, as described, such mechanism consisting, in part, of the rod, y, and the lever, b.

I claim combining with the charge chamber, C, and the magazine, E, the intermediate chamber or carrier, M, said charge chamber, C, and carrier being connected with and operated simultaneously by the guard, as described.

SAWING SHINGLES—Chas. Ketcham, (assignor to C. G. Judd and Andrew Oliver,) of Penn Yan, N. Y.: I claim, first, the feeding trough, C, for containing the shingle, or stock block, constructed as described and arranged, in relation to the means for feeding and the means for cutting, as set forth.

Second, the receiving trough 2, having the grooves in it, to receive each shingle, while being cut and holding them sufficiently to permit their easy and ready removal from the saws, in compact and orderly condition.

Third, the arrangement of the adjustable inclined levers, O O, by pressure exerted in the line of the edge of the shingle being cut, by means of the rollers, X X, or their equivalents, held and moved substantially as stated, in contradistinction to the holding of the block by lateral and end pressure, as is usual in shingle making machines, so that the shingle being cut, is neither pressed upon the sides of the saw, as must occur when lateral pressure is used; nor the block upon the teeth of the saws, as must occur when pressure is made.

CORN AND COB MILLS—D. S. James, of New Market, Va. (assignor to himself, J. B. White, of Dinwiddie C. H. Va., & J. W. McIntyre, of Dinwiddie Co., Va.: I make no claim to any of the parts of the machine separately considered; neither do I claim the simultaneous rotation of shell and burr; nor the means by which the same is produced, as such is not new.

I claim suspending the rotary shell by an upper arch, upon a shoulder of the main spindle, when the said shell is connected at bottom with the burr, as described, and the moving power applied directly to the shell, whereby friction is greatly diminished and consequent facility of operation attained.

PAGING BOOKS, &c.—W. C. Demain (assignor to A. B. Ely,) of Boston, Mass.: I claim operating the numbering wheels, by means of the springs, h k, whereby the first wheel is caused to actuate all the others, and the operation of the machine is rendered automatic, in the manner set forth.

Second, the repeating wheel operating according to the form and frequency of the notches thereon, substantially as described.

Third, I claim the drum with its notches, f g, in combination with the numbering wheels.

Fourth, the gate, F, in combination with the numbering wheels, and the parts which set them in motion.

[This is said to be the best book paging machine ever made: for rapidity of operation, excellence of work, simplicity in construction, and cheapness of operation, it will certainly take the palm. Few persons would be apt to think that the patent right for an apparatus which was merely used for stamping the numbers on to the pages of account books, was of any great value; yet the patent for a machine for this purpose was sold to certain parties, not long since, for *one hundred thousand dollars*. Such facts cannot fail to encourage inventors to persevere in whatever they are trying to produce.]

FOLDING PLATFORM—Jno. Cram,)assignor to himself and J. S. Cram,) of Boston, Mass: I claim combining the platform or seat, A, with the back legs, C C', by means of the turning or front legs, D D', and the connecting links or bars, E E', and so that said seat or platform may be either turned down horizontally so as to be supported on both sets of legs, or they and the seat be folded together.

BURGLARS ALARM—Alfred Bingham (assignor to himself and A. J. Bailey,) of Boston, Mass.: I do not claim combining with the match holder a roughened surface for the match to rub against.

But I claim arranging the friction surface when applied to a spring, bent as set forth, at an angle with the match holder or its path of movement, as described, in order to facilitate the ignition of the match, when the holder is in movement.

I also claim making the friction surface to revolve, as described, in order that a fresh portion of the surface may be exposed to the match, whenever any part of the surface becomes worn or unfit for use.

I do not claim the combination of an alarm apparatus or movable match holder, or friction surface, and a lamp; nor the combination therewith of a contrivance for casting the extinguisher off the wick tube of the lamp.

But I claim the described arrangement of the match holder, cast-off lever and hammer rod of the escapement, whereby the holder is retracted, the escapement apparatus will be controlled, but during the forward motion of the match holder, not only will the cast off lever be tilted so as to throw the extinguisher off the wick tube, but the escapement set free, so as to enable the alarm mechanism to operate and strike the hammer with repeated strokes upon the bell.

JOURNAL BOX ALLOYS—B. F. Lawton, M. D., of Troy, N. Y.: I claim the aforesaid box metal, or alloy, as an improved material, for the purposes of forming locomotive crank boxes, piston rings, journals, boxes, axles, and other rubbing surfaces, of the moving parts of machinery.

HARVESTERS—Chas. Bradfield, of Philadelphia, Pa.: I claim the arrangement of the pulleys, D E f, on and near the axle, and the finger and cutter bar underneath the axle, when the cutters are operated from said pulleys, through the intervention of the endless belt, g, cranks, pitman, and connecting rod, as set forth.

CURTAIN ROLLERS—D. H. Chamberlain, of West Roxbury, Mass.: I claim attaching the spool directly to the spindle, and causing it to revolve with the curtain rod, when the spool is forced towards the jamb by the spring, g, as described.

RE-ISSUES.

CLOSING AND OPENING GATES—Wm. G. Philips, of Newport, Del. Originally patented March 7, 1854: I claim a double span, rotating gate, opening and closing, by an intermittent rotating motion, in one direction, only said motion being derived through lifting pieces or levers, cam planes, weights, or cords, or their equivalent.

LANTERNS—Hugh and James Sangster, of Buffalo, N. Y. Patented originally June 10, 1851: We do not claim fastening lamps to lanterns by spring catches; nor do we claim attaching said catches to the upper part of the lamp and extending them down, so as to spring outward over a flange in the lantern.

But we claim constructing and arranging the spring catches, I, or its equivalent, to cause the attachment of the lamp to the lantern by the operation of pressing the lantern down upon the spring catches.

Also, arranging the thumb piece, L, within the flange, G, at the base of the lamp, by extending the spring, I, towards each other, horizontally, and thus forming the elbow catch, to rest against the shoulder on the flange, E, of the lantern.

DESIGN.

IRON RAILINGS—M. H. Fowler & Enoch Jacobs, of Cincinnati. O.

Honor to an American Inventor.

The Emperor of Austria has conferred upon Professor Morse the large golden medal for arts and sciences, in consideration of the valuable services rendered by him to science by his system of telegraphs, which has been extensively applied in the Austrian dominions.

Scarcely twelve years have elapsed since Professor Morse's first public experiment in Electric-Telegraphing was made between Baltimore and Washington. Now there are about fifty thousand miles of the wires in operation, and they stretch under seas and over mountains, into almost every part of the habitable globe. Nearly as many miles more are in progress of construction. The Electric Telegraph is the wonder of our age. Its practical introduction is chiefly due to the ingenuity of our American citizen, who, previous to the realization of his great idea, was almost unknown to fame. This fact should afford great encouragement to all inventors. They hold the keys to myriad other treasure chambers of invention, as yet untouched and undeveloped.

Trial of Reaping Machines in France.

On the second of last month, the various reaping machines in the Paris Exhibition were subjected to several trials before an international jury. The first trial took place with a small French one horse reaper, a Bell's machine, which was made in France, and Wright's American automaton self-raker (Adkin's invention.) The latter beat the other two, and the small French reaper beat Bell's. The second trial was with a Bell's reaper, made by Crosskill, Manny's reaper, and another French machine. Crosskill's machine soon broke down, Manny's worked very heavily, and did not do good work. The third trial was between the machines of McCormick and Hussey, in which the former came off victorious, by doing more work with greater ease, and a greater quantity of it than any of the other machines.

After these trials, McCormick's machine was challenged to compete with Wright's and Manny's reapers in mowing a field of *lucern*. In this trial it again proved the victor. In another trial in a field of wheat, with Manny's reaper, McCormick's reaper proved itself superior.

Such are the accounts we have received of these trials by our foreign exchanges. Another series of trials with reapers was to be made on the 14th, but we have not yet received an account of them. Thus far McCormick's reaper has proved itself better than all its American and foreign competitors.

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The Tribune and the Scientific American on Locomotion.

The *Tribune* of the 14th inst. contains an article in reply to ours in No. 48; it commences as follows:—"A recent article of ours on locomotion, has provoked the criticism of the SCIENTIFIC AMERICAN. We said that but for the resistance of the air, with the engineering requisite for the circumstances, a speed of a hundred miles an hour might be attained on a railroad economically—we did not say how safely." The article of the *Tribune* which we criticised, stated very plainly that but for the resistance of the atmosphere, railroad trains might run *very* economically, at the rate of *several* hundred miles per hour. This, we thought, required correction, as many persons not acquainted with the subject might be led to form the opinion that the resistance of the air was the principal obstacle to our railroad trains adopting higher speeds. At the present time the speed of express trains on the New York and Erie Railroad is thirty-five miles per hour, and on the New York Central forty miles and if this were increased to fifty miles, the resistance of the atmosphere—as we presented the question—would only be 12 1-2 lbs. on the square foot of frontage—a mere trifle in the running of trains at such a speed. If this were the only obstacle to our railroad trains increasing their speed to 100 miles per hour, it would not give the engineers or superintendents a second thought.

We have always endeavored not to make a dubious statement in discussion for the mere purpose of making a good case. The amount of resistance, 12 1-2 lbs. on the square foot, on trains running at the rate of 50 miles per hour, is the amount of pressure exerted by the wind on a stationary body, and recorded by numerous experiments, and we presented this amount, so that no person could say we under-stated it. But Dubuat has observed, that both in the case of air and water, the resistance to a body moving through them with a certain velocity is less than the resistance of the air or water moving with the same velocity against the body at rest; according to Emerson, the mathematician, the resistance is but one half. It has also been found that the resistance of the air to a body, if it is a cube like a railway train, is as 0014 to 0017 of a plate embracing the same area of frontage. The resistance of the atmosphere, therefore, to railroad trains moving at the rate of 100 miles per hour, may, upon good authority, be set down as low as 25 lbs. on the square foot of frontage—it cannot at least, by any possibility, be more than 50 lbs. But for the sake of all that is sensible in discussing improvements in science and art, let no one talk any more about the difficulties of atmospheric resistance to railroad trains running at the rate of two hundred or one hundred miles per hour, as long as our fastest trains are running only at the rate of forty.—When they attain to 50, 60, or 100 miles per hour it will be time enough to talk of atmospheric resistance.

The *Railroad Advocate*, of the 18th, returns to another interloping charge. We did not suppose there was a single paper in our country, that could so stupidly understand the subject and misrepresent it. It now admits all we contended for, but insinuates to the contrary. It states there is a resistance arising from friction, and a resistance from concussions, "the principal one up to a speed of 100 miles per hour." This latter, it asserts, merely increases directly as the velocity, while the atmospheric resistance is as the square of the speed. This is not correct, the resistance of concussions increases as the square of the speed also.

The *Tribune* of the 18th contains a second and very unfair reply to our remarks. It expresses sorrow at us "manifesting so strong a disposition to ignore the question whether atmospheric resistance increases in the duplicate ratio of the velocity." Now we have done no such thing. We simply proved a negative to atmospheric resistance being the cause of preventing railroads running very *economically* at high speeds. We have done more than comply with the legitimate rules of discussion in what we have said. The *Tribune* has not yet proved a positive; but as it has asked for more information on the subject, we will give it.

D. K. Clarke, the very best authority on railroad engineering, says, respecting railroad resistances: "they are divisible into two parts—the *constant* and the *variable* resistance, of which the latter varies as the square of the speed, starting from nothing, when the train is just in motion. The *constant* resistance is due to the internal friction of wheels, axles, and machinery; the *variable* resistance is due to the atmosphere, to lateral oscillation, and concussion, to vertical oscillations, and concussion between the wheels and rails."

"All these *varying* resistances ought to vary, we believe, as the square of the speed, as we find in fact *they* do, *and not as the speed simply.*"

These were the conclusions at which he arrived after a number of personal experiments made upon railway trains to test the resistances, with proper apparatus, and also by an examination of D. Gooch's tables of experiments. No matter, then, what speed may be adopted on our railroads, all the variable resistances increase as the square of the velocity, and at present speeds, the atmospheric resistance is by far the smallest. This has been found to be the case in the working of all our railroads. We have been the constant advocate of improvements in our railway system, and have frequently pointed to the great source of expense in working them, viz., defective permanent way, embracing numerous curves, inclines, bad tracks, &c. For this we have received the thanks of many engineers at various times, and we shall never be diverted from advocating sensible improvements in railroad engineering by absurd and ignorant declamations about *air* resistance.

The *Tribune* asks us some questions respecting Ithiel Richardson's method of sending packages through a vacuum tube. It still entertains very wrong theoretical ideas respecting it. It says, "when you have got rid of atmospheric resistance it is obvious that any constant force which is more than able to move a load, will, on a level, cause it to move with an accelerated velocity like that of a falling body."—This cannot be a correct comparison, as the accelerated velocity of falling bodies is caused by the attraction of gravitation, the force of which increases according to the square as two bodies approach one another. A railroad train upon a level, or a parcel in a tube, with the atmospheric resistance removed could not be moved by a constant force to acquire an accelerated velocity, because they would have to overcome constant and variable resistance at every point along their whole course.—The expression of the *Tribune*, "any constant force which is more than able to move a load," is very obscure. We presented no arguments against Mr. Richardson's plan of sending messages and packages through a vacuum tube; we would really like to see it tried.

The *Tribune* will find some useful information on this subject on page 298, Vol. 8, SCIENTIFIC AMERICAN.

On the Manfacture of Steel.

The following is the substance of a paper read a short time since by Charles Sanderson, Esq., before the Royal Society of Arts, London, and published in the London *Mechanics Magazine* and the *Mining Journal*.

The kinds of steel which are manufactured are natural steel, called raw steel, or German steel; Paal steel, produced in Styria, by a peculier method; cemented or converted steel; cast-steel, obtained by melting cemented steel; puddled steel, obtained by puddling pig iron in a peculiar way.

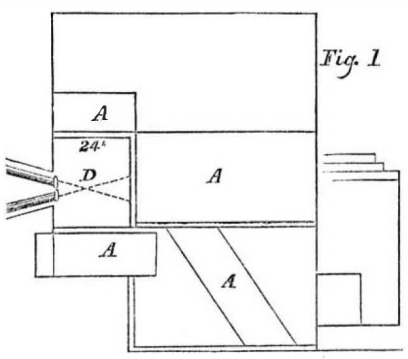

Fig. 1

Natural or German steel is so called because it is produced direct from pig iron, the result of the fusion of the spathouse iron ores alone, or in a small degree mixed with the brown oxyd; these ores produce a highly crystalline metal called *spiegel eisen*, that is, looking-glass iron, on account of the very large crystals the metal presents. This crude iron contains about four per cent. of carbon, and four to five per cent. of manganese. Karsten, Hassenfratz, Marcher, and Reamur, all advocate the use of gray pig iron for the production of steel; indeed they state distinctly that first quality steel cannot be produced without it; that the object is to clear away all foreign matter by working it in the furnace, to retain the carbon, and to combine it with the iron. This theory is incorrect, although supported by such high authorities. Gray iron contains the maximum quantity of carbon, and consequently remains for a longer time in a state of fluidity than iron containing less carbon; the metal is then mixed up, not only with the foreign matter it may

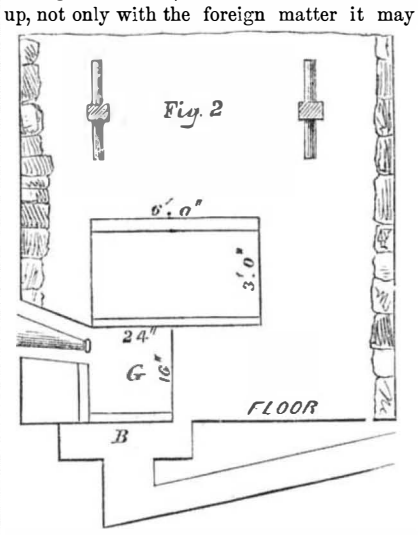

Fig. 2

contain, but also with that with which it may become mixed in the furnace in which it is worked. This prolonged working, which is necessary to bring highly carbonized iron into a malleable state, increases the tendency to produce silicates of iron, which entering into composition with the steel during its production, renders it red short. Again, by this lengthened process, the metal becomes very tender and open in its grain; the molecules of silicate of iron which are produced will not unite with the true metallic part; and also, whenever the molecular construction of iron or steel is destroyed by excessive heat, it becomes unmalleable. Both these are the causes of red shortness, and also of the want of strength when cold. In Austria, however, they have improved upon the general continental process, their pig iron is often highly carbonized, but

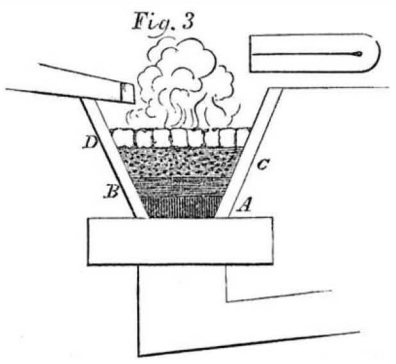

Fig. 3

they tap the metal from the blast furnace into a round hole, and throwing a little water on the surface, they thus chill a small cake about half an inch, this is taken from the surface, and the same operation is performed until the whole is formed into cakes; these cakes are then piled edgewise in a furnace, are covered with charcoal, and heated for 48 hours; by this process the carbon is very much discharged. By using these cakes in the refining, the steel is sooner made, and is of better quality. Pig iron can only be freed from its impurities whilst in a fluid state. It should be purified in that state to obtain a purer metal for the production of steel. The metal itself being to some extent decarbonised, is sooner brought into "nature," as it is termed; that is, it sooner becomes steel. The process being shorter, and the metal itself being purer, there is less opportunity for the formation of deleterious compounds, which becoming incorporated with the steel, seriously injure its quality. Of course steel manufactured from crude iron, either purified or not, of any defined quality, will inherit such quality, be it good or bad. Art can in some degree remove these noxious qualities from the crude iron.

The furnaces in which raw or natural steel is manufactured are nearly the same, as far as regards their general construction, in all countries where such steel is produced; yet each country, or even district, has the fire in which the metal is worked differenly constructed.—We find, therefore, the German, the Styrian, the Carinthian, and many other methods, all producing steel from pig iron, yet pursuing different modes of operation. In Seigen they use the white carbonized manganesian metal, while in Austria a gray or mottled pig iron is used.

The furnace is built in the same form as a common charcoal refinery.

Fig. 1 shows a ground-plan of the furnace; fig. 2 an elevation; and fig. 3 the form of the fire itself and the position of the metal within it. The fire, D, is 24 inches long and 24 inches wide; A A A are metal plates surrounding the furnace.

Fig. 2 shows the elevation, usually built of stone, and braced with iron bars. The fire, G, is 16 inches deep and 24 inches wide. Before the tuyere, at B, a space is left under the fire, to allow the damp to escape, and thus keep the bottom dry and hot.

In fig. 1 there are two tuyeres, but only one tuyere-iron which receives both the blast nozzles, which are so laid and directed that the currents of air cross each other, as shown by the dotted lines; the blast is kept as regular as possible, so that the fire may be of one uniform heat, whatever intensity may be required.

Fig. 3 shows the fire itself, with the metal, charcoal, and blast. A is a bottom of charcoal rammed down very close and hard. B is another bottom, but not so closely beaten down; this bed of charcoal protects the under one, and serves also to give out carbon to the loop of steel during its production. C is a thin stratum of metal, which is kept in the fire to surround the loop. D shows the loop itself in progress.

When the fire is hot, the first operation is to melt down a portion of pig iron, say 50 to 70 pounds, according as the pig contains more or less carbon; the charcoal is then pushed back from the upper part of the fire, and the blast, which is then reduced, is allowed to play upon the surface of the metal, adding from time to time some hammer slack, or rich cinder, the result of the previous loop. All these operations tend to decarbonize the metal to a certain extent; the mass begins to thicken, and at length becomes solid. The workman then draws together the charcoal and melts down another portion of metal upon the cake. This operation renders the face of the cake again fluid, but the operation of decarbonization being repeated in the second charge, it also thickens, incorporates itself with the previous cake, and the whole become hard; metal is again added, until the loop is completed. During these successive operations the loop is never raised before the blast as it is in making iron, but it is drawn from the fire and hammered into a large bloom, which is cut into several peices, the ends being kept separated from the middle or more solid parts, which are the best.

This operation, apparently so simple in itself, requires both skill and care. The workman has to judge, as the operation proceeds, of the amount of carbon which he has retained from the pig iron; if too much, the result is very raw, crude, untreatable steel; if too little, he obtains only a steelified iron. He has also to keep the cinder at a proper degree of fluidity, which is modified from time to time by the addition of quartz, old slags, &c. It is usual to keep from two to three inches of cinder on the face of the metal, to protect it from the direct action of the blast. The fire itself is formed of iron plates, and the two charcoal bottoms rise to within nine inches of the tuyere, which is laid flatter than when iron is being made. The position of the tuyere causes the fire to work more slowly, but it insures a better result.

The quantity of blast required is about 180 cubic feet per minute, at a pressure of 17 inches water gauge. Good workmen make 7 cwt. of steel in 17 hours. The waste of the pig iron is from 20 to 25 per cent., and the quantity of charcoal consumed is 240 bushels per tun. The inclination of the tuyere is 12 to 15 degrees.—The flame of the fire is the best guide for the workman. During its working it should be a red blueish color. When it becomes white the fire is working too hot.

This concludes first part of Mr. Sanderson's very useful paper on natural steel. The second part embraces a distinct manufacture of steel, and is entirely separate from this.

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New Inventions.

Value of Patents.

Mr. Amos Lyon, of Worcester, inventor of a very simple improvement in lightning rods, which we illustrated in our paper not long since, informs us that he has sold rights this year to the amount of between eleven and twelve thousand dollars. Stephen D. Carpenter, of Wisconsin, whose simple rotary pump we illustrated in No. 31 of our present volume, has realized about fifty thousand dollars this year from his invention. He was robbed in the cars, out West, not long since, of eleven thousand dollars cash—proceeds from his patent, we presume.

We should be pleased to have inventors post us up from time to time, as to their sales and successes with inventions. Such items arrest the attention of capitalists and serve to enhance the value of every species of patent property.

New Coal Burning Locomotives.

The Philadelphia *Ledger* states that the builders of locomotives, in that city, are busily engaged in constructing coal-burning locomotives. Baldwin & Co., placed a first class one of 25 tuns, yn the Mine Hill Railroad two weeks ago, and they have four others of the same character, nearly ready, for the Lehigh Valley Road, one for the Swatara Road, one for the Steubenville, and one for the Reading Railroad. It also says:—"From recent ezperiments made on one of the roads running from this city, with one of Baldwin's locomotives it appears that the expense is only about one half that of the wood-burners. A thorough examination is now being made of the matter, which will shortly be made public."

Block for Forming Horse Collars.

The accompanying figures represent an adjustable block for stretching and forming horse collars, for which a patent was granted to J. Van Benschoten, of Poughkeepsie, N. Y., on the 3rd of last July.

Figure 1 is a perspective view, and fig. 2 is a longitudinal vertical section of the block, taken through the center.

A represents a cast iron plate which may be permanently secured on a table or bench. The front end of this plate is of semicircular form, and the sides of the plate gradually expand outward from the front to the back end. On the front end of the plate, A, there is a stationary jaw, B, of cast iron, secured to the plate or cast with it. The upper part of this jaw is of semi-circular form, and its sides are concave. C C are movable jaws made of cast iron. These jaws are of oblong shape, their back ends being rounded, and their outer sides or edges gradually expanding outward from their front to their back ends; the shape of the three jaws, when in contact as shown, correspond to the shape of a horse collar; the front stationary jaw, B, corresponding to the top end of the collar, and the two movable jaws corresponding to the lower part, the sides of the jaws being concave to correspond to the inner surface of the collar. The under surfaces of the two movable jaws, C C, are provided each with recesses or grooves, in which guides or ways on the upper surface of the plate, A, fit; these ways are placed obliquely on plate A, and gradually expand outward from the front to the back end of it.

D represents a screw rod which works in a bearing, *e*, at the back end of the plate, A. It is fitted between the lower parts of the two movable jaws, C C, and has a nut, E, upon it, to which nut two spring arms, *f* (one shown,) are attached, the outer ends of the spring arms being attached to the front ends of the movable jaws, C C, at their lower parts.

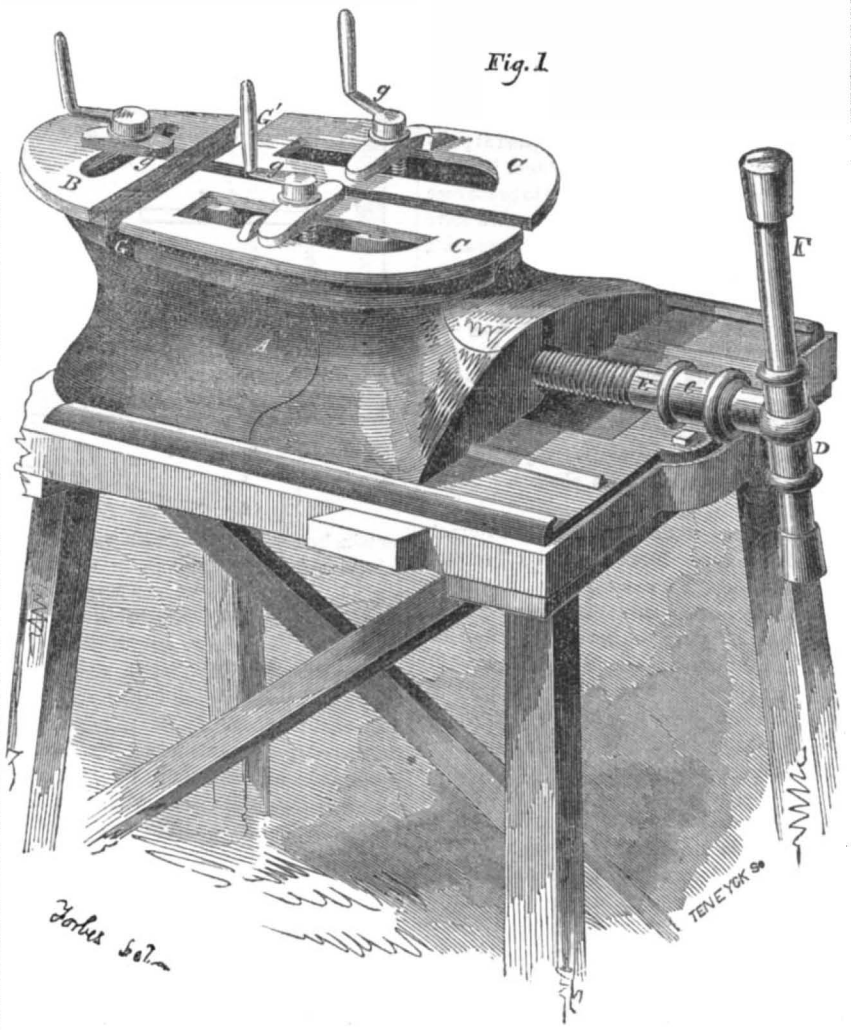
The outer end of the screw rod is provided with an arm or lever, F. On the upper surface of each jaw there is attached by a screw, *g*, one or more plates, *h*. These plates correspond to the shape of the jaw to which they are attached, and are for the purpose of increasing the thickness of the jaws, so that they may correspond to the size of the collar to be stretched or formed. These plates may be constructed of cast iron, and of various thicknesses, and more or less of them used, according to the size of the collar.

The jaws, C C, are moved up to the stationary jaw, B, by operating the screw rod, D, and the collar, represented by G, is placed over the three jaws, C C B, the screw rod, D, is then turned from left to right, and the two jaws, C C, are moved in consequence, backwards and outwards, and the collar, G, is stretched or formed to the desired size and shape. To the stationary jaw, B, at each side there is attached a metallic plate corresponding in form to the edges of the jaws. These plates form an unbroken edge or surface all around the jaws when the jaws are distended.

By this arrangement and operation of the oblique sliding jaws, C C,—whereby they effect simultaneously the longitudinal and lateral stretch of the collar gradually and uniformly along either side of it through the greatest portion of its length, and towards its broadest end, where the capacity for stretching is greatest, while the narrow and front or upper end of the collar is firmly held by the stationary jaw,

BLOCK FOR FORMING HORSE COLLARS.

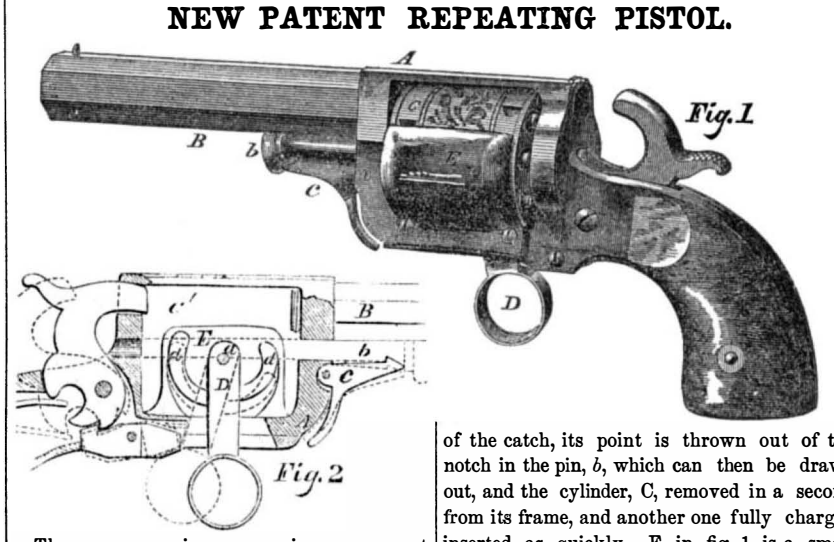
Fig. 1



B—no undue pressure or stretch in any one part will occur. The stretching action laterally and longitudinaliy is smoothly and evenly effected by the longitudinal pressure of the oblique sliding jaws along either side of the collar, the form of which is better preserved, while the work is performed with increased facility. The arrangement shown and described of the operating screw nut, E, with the sliding jaws, C, by its attachment thereto by the spring arms, *f*, it will be observed that the greatest freedom of action is insured to the sliding jaws, C, and that the screw nut having no other bearing than that on the screw rod, presents no restriction whatever to the lateral as well as the longitudinal, and free and independent actions of the two oblique sliding jaws on their ways.

More information may be obtained by letter addressed to the patentee at Poughkeepsie.

NEW PATENT REPEATING PISTOL.



The accompanying engravings represent Beal's patent repeating pistol, manufactured by E. Whitney, of Whitneyville, Conn.

Fig. 1 is a perspective view, and fig. 2 is a longitudinal vertical section, through the lock, and revolving charge cylinder to show how the latter is operated.

A is the frame which supports the stock. B is the barrel with its breech passing through and shutting with a gas joint against the charge cylinder, C. *b* is a steel pin passing through an orifice in the center of the cylinder, C, into the plate behind it, and serves for the axis of the charge cylinder. It is held in place by a spring catch, *c*. By pressing on the lower end of the catch, its point is thrown out of the notch in the pin, *b*, which can then be drawn out, and the cylinder, C, removed in a second from its frame, and another one fully charged inserted as quickly. E in fig. 1, is a small plate secured to one side of the frame, A, and conveying part of cylinder, C. In fig. 2 the inside of it is shown on which is secured a vibrating double armed ratchet, *d d*, which is connected by a pin, *a*, to the upper part of the finger of trigger, D. There are a row of notches on the outside of cylinder, C, near each end, and the ratchet points, *d d*, operated by the trigger, D, take into these notches alternately, and rotate the charge cylinder, to bring the loaded chambers successively opposite to and in contact with the barrel, B, to be discharged. The hammer or dog head is held on cock by a vibrating catch beneath it; this is set free to strike the caps on the back of each charge chamber, by pulling on the trigger, the thimble of which is thus made to press on one end of the hammer catch, as shown by the dotted lines fig. 2, and thus set it free to strike the cap.—This is the most simple aud convenient repeating pistol that has as yet been brought to our notice. An extra charge cylinder can be used owing to the very simple method of changing it. When the hammer is cocked, or half cocked, the cylinder can be revolved without releasing the hammer, as it is in all cases revolved by the forward and backward motion of the trigger, which vibrates the ratchet, *d d*. It can be loaded with great rapidity, and by having two such small cylinders as C, it will enable a person to have fourteen shots always ready, and in a very small compass.

More information may be obtained by letter addressed to the manufacturer, at Whitneyville.

Easy Prevention of Yellow Fever or Cholera. Recipe for making Chlorine.

The following has been published by a number of our exchanges as a means of preventing yellow fever:

"Take five ounces of common table salt and one ounce of the peroxyd of manganese. Stir these together until they are well mixed, and then pass the mixture through a glass funnel, (a little at a time, for fear of choking the tube,) into a wine or porter bottle. Take then half an ounce (by measure) of sulphuric acid, and add to it three ounces of water. Pour this also into the bottle and shake it moderately, (without tipping it so as to separate the ingredients) and chlorine will soon begin to issue from the bottle in sufficient quantities to disinfect the atmosphere of a room. After an hour or two, it can be removed to another room, and so on until every room, shed, out-house, &c., has been purified. It is, however, thought to be sufficient to confine it to those rooms that are constantly inhabited. It is well to shake the bottle three or more times a day."

[This is indeed a simple method of generating chlorine gas, which is a most excellent disinfectant, but a more simple method is to purchase a pound of the chloride of lime at any of the druggists, and put a few ounces of it on a saucer, then pour a little vitriol into it, when the fumes will at once be seen to arise, and dis infect a large space filled with noxious vapors

Reapers in Texas.

A gentleman in Texas, writing to his correspondent in this city, asking information as to the best reapers, and some other agricultural implement, says, "I shall prefer those substantial, durable, and perfectly constructed, to any inferior article, without regard to price. The great fault, I find, in making implements for farming purposes, is, that cheapness is consulted rather than quality. I think our country will, in a few years, produce wheat and flour for export."

It is a fact worthy of note, that a large district of country in Texas produces the finest wheat, and the same lands are surpassed by none in the United States for the production of cotton.

Protecting Wrought-Iron Pipes.

One of our constant readers—Jacob Hake, of Grand de Tour, Ill.—writes us that he is desirous of obtaining some wrought-iron pipe,—like gas pipe—for a deep well, if it can be prevented from rusting. He applied to various persons for such pipe, but none were willing to warrant them protection from oxydation in water.

Preserving Green Vegetables.

One of our exchanges says that green beans, green peas, and roasting-ears may be had every day in winter at a very trifling amount of trouble by being packed away in salt. The salt is removed by steeping in warm water. This plan can be easily tested.

Patent Case.

In this city on ths 23rd ult., a motion by J. Stimpson for an injunction to restrain M. Brooks from using a machine to turn pianoforte legs, was denied by Judge Nelson.

The Pope's Government at Rome has made an annual appropriation of $10,000 for the en couragement of tree planting in the Papal States.

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Scientific American.

NEW-YORK, SEPTEMBER 1, 1855.

Steam Boiler Incrustations and their Remedy

One of the greatest evils experienced by those who use *hard* water for steam boilers, is the crust or stony scale that forms on the plates inside, and which, being a non-conductor obstructs the passage of heat from the fire to the water, thereby causing a great loss of fuel; while, at the same time, it injures materially the metal, and is sometimes the cause of explosions.

Not apprehending difficulties from this source, the first locomotives that were placed, last year, by United States engineers on the Copiapo Railroad, in Chili, S. A., they supplied them with feed water from wells which in one week placed their engines *hors du combat*, by depositing a thick incrustation of carbonate of lime and magnesia, in the boilers.

From some parts of Ohio, we have received communications respecting incrustations forming in boilers in the same short space of time; and in our experience with feed water for a boiler, drawn from a deep well in the limestone formation, a crust used to be formed so thick and hard, that it had to be removed regularly every two weeks with a pick The remedy in this case was the substitution of soft water. Two large ponds were constructed covering two acres. The engine was a large condensing one, and the water in the condenser was pumped out into the end of one pond—from which it slowly circulated—cooling in its progress—into the extreme end of the other, from whence it was taken to feed the boilers and condense the steam. The same water was used over and over again in the engine—the amount lost by evaporation and leaks being more than made up by rains.

In this city, before the introduction of the Croton water, boiler incrustations, caused by using well water, were a source of continual trouble and expense to every one using steam engines. With the Croton water, no scale is formed, the only deposit in steam boilers is mud, which can easily be removed by frequent "blowing out."

Various substances have been used to prevent incrustations in boilers, such as mahogany sawdust, muriate of ammonia, tannic acid compounds, oak wood blocks, &c., but the objection urged against all of these, is that they injure the metal. If soft water can be obtained, in any locality, *hard* water on no account should be used; but as many persons cannot obtain a sufficient supply of it, of course they must put up with what they have. To them, the best means of removing the incrusting matter from the water, before it enters the boiler, is the only information that would really be useful. One of our correspondents has stated that by exhausting the steam into the feed water box, raising the water to a high heat, then suffering it to flow through wood shavings in another box, before entering the boiler, the water will be purified, and deposit no scale. This method we really believe to be good, and its merits have been confirmed by an engineer—A. B. Von Rathen—who, in a recent communication to the London *Mechanics' Magazine*, states that for ten years he has used heated feed water, during which time no fixed incrustation was ever formed in the boiler. The feed water he heated in tubes before entering the boiler; using for this purpose, the waste heat of the furnaces, where it enters the chimney. M. Causte—a French engineer—asserts that *hard* water heated up to 318° Fah., will then deposit its earthy matter—carbonate of lime and magnesia, &c.; and thus, by heat, he contends that all water for steam boilers, no matter how much earthy matter it may contain, can be purified and thus obviate the possibility of forming incrustations. He also contends that a saving of 50 per cent. of fuel will be effected by heating the feed water; but Von Rathen says that this is too much: still, he admits a gain of 25 per cent. On the 16th of January last, G. Weissenborn, of this city, obtained a patent for an apparatus to purify feed water, embracing heating the water and allowing it to flow through a substances on which it deposits all its encrustating matter. We have been assured that the method is capable of removing the incrustating matter from all kinds of hard water, and even the saline matter from sea water. Here, then, is data of no small value to those who use non-condensing engines and exhaust their steam into the atmosphere; and also to those who use cold feed water. The plan can be carried out at no expense at all, and it is worthy of the attention of every one who uses a steam engine.

The Marble Sawing Invention.

Those who have been accustomed to examine the pages of the SCIENTIFIC AMERICAN, well know that it never has been a part of our disposition to check or in any manner to retard the progress of new invention. On the contrary, they must have observed that we seldom lose an opportunity to put in a good word of encouragement to inventors, for the purpose of stimulating them to increased perseverence in the pursuit of whatever useful object may, at the time, occupy their attention,—or to urge them forward upon entirely new voyages of mental discovery. This we shall always do. The beneficial results of this course, continued as it has been for years past, now manifest themselves in the many noble inventions that have already been introduced, and that are so rapidly springing into existence,—inventions that have done much to promote the material prosperity of our people at home, and that have conferred high honor and glory upon the American name abroad.

With this premise, we shall take occasion to give a delicate hint of caution to inventors, upon the subject of Marble Saws. Since Mr. Manly's liberal offer of $10,000 for the best sawing machine, the inventive world appears to have gone all agog on the subject. There seems to have suddenly arisen a very general opinion that there never was such an easy task set before a man, as to carry off this prize.—We have been overwhelmed with letters from all parts of the country, containing drawings and descriptions of devices intended to accomplish the desired purpose, upon which our judgment has been solicited—and cheerfully given. Quite a large number of applications for patents and caveats have been made through us, and "the cry is still they come." If this rush continues much longer, we shall not only have to enlarge our own premises, but Congress will have to be petitioned to erect and set aside a new Patent Office building, for the exclusive accommodation of Marble Saw Models.

Now, we have no objections to make against inventors, turning their attention to the subject, and to their entering, heart and soul, in large numbers, upon this novel race. But we would correct the impression they seem so generally to have formed, as to the ease of the conquest. So far, they seem to fix upon the first device which comes into their minds, and without any deep study or examination, turn out a model, and enter the competing lists.—We feel certain that these are in many cases the facts, because so large a proportion of the devices submitted to us are alike. Of the many plans we have seen, all, with very few exceptions, contain the same general features. When the various applications for patents come up for official examination, at Washington, there will be a fine lot of interferences declared, and a grand scrabble among inventors in proving priority.

Our remarks are not intended to discourage any one from endeavoring to bring forth the desired improvement; but to make them think harder and observe closer. All the more primitive ways of arranging the saws so as to cut at an angle, with adjusting screws, guides and frames; also double and single cranks, and walking beams for applying the power,—have been invented. We have examined an endless variety of them, and before these lines reach the reader, many others will have passed under our notice. If there is, by possibility, any new path into which inventors can strike out, they will do well to try and find it, for the field of devices already described, is, to our view, pretty generally covered. It will be some time yet, probably, before the "trump" turns up. There is ample time and room for the display of real ingenuity.

In the meantime, as heretofore, we shall be happy to advise with inventors either personally or by letter, as to the novelty of their improvements—whether upon Marble Saws or any other subjects,—and to prepare drawings and specifications for those who desire to apply for patents. Touching this last matter we must say that we dislike very much to act as agents in patent cases where we can see no novelty. It is like a lawyer trying to defend a client whom he knows, all the time, to be guilty. If, therefore, we are to have Marble Saws, let them not be all alike.

The Vermont prize cannot fail to produce important benefits. It has already set many an individual to thinking, who never knew before that he was capable of an idea. It will have a similar effect upon hundreds of others. Not only will they be led to cogitate upon the marble business generally, but upon various other subjects, and in the end their minds will be improved, and higher positions reached.—There is nothing more elevating than the squeezing out of ideas, and the practical application of them to the wants of mankind.

To All Whom it May Concern.

In the course of business we have been compelled to adopt the inflexible rule of discontinuing to send the SCIENTIFIC AMERICAN as soon as a subscription expires. If we did not carry out such a regulation, and treat all our subscribers alike with respect to it, our affairs would soon run into a very confused and disagreeable state.

While making this plain statement, we would call the special attention of all our readers to the fact that the present number of our paper is *the last but one* of the volume, and that, consequently, in one week from this date, nearly all of their subscriptions will expire. After what we have said, we presume they will perceive the necessity of renewing them without delay. This will save us the trouble of crossing off their names from our books, as well as prevent the risk, to them, of losing any of the first numbers of the new volume. No one should miss the reading of a single issue of the SCIENTIFIC AMERICAN, for in that copy, ten chances to one, will be fouud the very information he has for years been wanting. We have known this to be the case in more than one instance.

We have again to repeat the earnest request made not long since to our subscribers, for their special aid this year in extending the influence of our journal. Times are good, the harvests are abundant, and future prospects flattering. Those who have hitherto hesitated or neglected to supply their minds from the fountain of knowledge offered to them in the pages of the SCIENTIFIC AMERICAN, need not wait any longer.

If each of our subscribers will take the trouble to inquire around a little in his town or village, and show our paper, we presume he will find individuals who will not only be glad to subscribe, but will thank him for the favor done in calling their attention to the work. At any rate those who take this trouble will put us under obligations to them. We therefore trust that each of our old friends, in remitting the money for his own subscription, will endeavor to send with it at least *one* new name. The increase of our circulation, in any locality by such means, even by a single copy, will be a good deed on the part of whoever accomplishes the same, since the object of the SCIENTIFIC AMERICAN is to improve, to elevate, and to educate the human mind. "Whoever makes two blades of grass to grow where only one before sprang up, is a public benefactor."

We suppose it is almost unnecessary to call the attention of the members of clubs, societies, institutions of learning, and canvassers, to the splendid list of cash prizes which we offer this year as special inducements to their activity. They will of course observe that in addition to the liberal discount offered them by our club rates, they have also the opportunity of competing for those premiums. We trust they will "spread themselves" this year, and see what they can do. The season is propitious, and with a little effort they can procure a host of new names..

We hope readers will excuse us for so often troubling them with domestic matters. But like the parson, we feel compelled to repeat the same notice both afternoon and morning, in order that those who failed to hear on the first occasion will be duly apprised on the next.

The Hon. Abbot Lawrence has left $50,000 by his will to the Lawrence Scientific School.

The Mason Testimonial.

Annexed we continue the list of contributions to this fund, kindly furnished by S. T. Shugert, Esq., Acting-Commissioner of Patents. It will be perceived that the amount begins to augment very flatteringly.

We would again remind all readers of the SCIENTIFIC AMERICAN who are about to renew their annual subscriptions, that they are at liberty to enclose to our care, any contributions they may wish to make to the fund. This will be more convenient to many than the sending of separate remittances.

The indications are that a very liberal response will be made to the call for this testimonial. The object is an important one; we hope soon to see a large addition of names to the "roll of honor."

SUBSCRIPTIONS TO THE "MASON TESTIMONIAL."

NAME.	RESIDENCE.	AMOUNT
FORBUSH & CROMPTON,		$10
JAS. M. THOMPSON,		2
G. H. TALBOT,		1
5 GENTLEMEN, who requested their names not to be published,		90
JAS. EMERSON,		2
J. F. MASCHER,		5
Previously received,		81
Total received to Aug. 22, 1855,		$191

A Large Tailor Shop—American Genius Abroad

We have before chronicled the sale to the French government, for the sum of $21,000 cash, of the right to use Avery's Patent American Sewing Machine. A correspondent of the New York *Tribune* states that there is a "large Government establishment in Paris, under the orders of the Minister of War, where about two thousand men and women are employed in making soldiers' clothes, tents, and outfits for the army, and about thirty of Avery's sewing machines have been put in operation recently by steam.

The director or superintendent of this large number of operatives and machines is a young American woman—Miss Alice Ames. She possesses a peculiar mechanical genius, being able to see through a sewing machine almost without looking. It is said that no one can operate an Avery machine equal to her. Even the inventor himself has to stand one side. She was employed here by the Avery Company for a long time, and when they began to operate in France she was sent over there. She is now in the service of his Imperial Majesty Napoleon III.

Under Miss Ames's able direction the soldiers are capable of making twenty-five to thirty pairs of pantaloons each per day—a success which has induced the Minister to give a great extension to the operations of this useful invention.

In connection with the sewing machines, the French government has also purchased the right to use another very ingenious American invention. We allude to Harraday's machine for cutting out clothing, illustrated on page 353, Vol. 9, SCI. AM. This invention is at work in the same shop. One machine is capable of cutting out 1000 pairs of pantaloons per diem. The French patents for both Avery's and Harraday's machines were taken out through the SCIENTIFIC AMERICAN Patent Agency.

SPLENDID CASH PRIZES!

The proprietors of the SCIENTIFIC AMERICAN will pay in cash the following splendid prizes for the fourteen largest list of subscribers sent in between the present time and the 1st of January, 1856; to wit:

For the largest List	$100
For the 2d largest List	75
For the 3d largest List	65
For the 4th largest List	55
For the 5th largest List	50
For the 6th largest List	45
For the 7th largest List	40
For the 8th largest List	35
For the 9th largest List	30
For the 10th largest List	25
For the 11th largest List	20
For the 12th largest List	15
For the 13th largest List	10
For the 14th largest List	5

Names can be sent in at different times, and from different Post Offices. The cash will be paid to the order of the successful competitor immediately after the 1st of January, 1856.—Southern, Western, and Canada money taken for subscriptions. Post-pay all letters, and direct to

MUNN & CO., 128 Fulton st., New York.

☞See prospectus on the last page.

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American Association for the Advancement of Science.—No. 2.

SEPARATION OF ALCOHOL FROM WATER BY GRAVITATION.—VIEWS OF THE SCIENTIFIC AMERICAN ESTABLISHED.—Prof. Henry detailed an experiment which was made at the Smithsonian Institute, in consequence of the granting of a patent for the separation of alcohol from whiskey, by placing a considerable quantity in a vertical tube. The patentee stated that by the use of a tube 100 feet in hight, he had separated 100 gallons of alcohol in 12 hours. The experiment was made in one of the towers of the Smithsonian, with a gas pipe 260 feet long, into which stop-cocks were inserted at various lengths. A most careful examination of the whiskey at the various hights was made at the end of a few hours, and also at the expiration of some months, but no more variation could be discovered than in different samples of the same whiskey not subjected to the process. The patentee had, however, obtained his patent and sold several rights at a high price. A paper was read at the last meeting of the Association announcing this discovery. The gist of his remarks was that the Patent Office, the Association, and the country had been sublimely humbugged.

The patent referred to was that granted to B. F. Greenough, Dec. 20, 1853, and the paper read at the last meeting of the Association at Washington was by Dr. Gale, the substance of which was published on page 278, SCIENTIFIC AMERICAN; and at the end of which we stated that our opinions differed from those of its author, and that we would take occasion, at some future time to review the matter. We did so, on page 325, in an article of some length, showing that alcohol could not be separated from water—removing the alcohol from the water of whiskey—by placing it in a long tube;—this was on June 24, 1854. And now what do we hear, but our views confirmed in every particular by experiments made since then, to test the question fully, and by one who stands at the very head of practical science in our country. If the Patent Office, the Association for Advancing Science, and the country have been deluded respecting this alleged discovery, it was not for want of warning from us.

FROZEN WELLS—Prof. J. Brocklesby read a paper on certain frozen wells in Owego, Tioga Co., N. Y. These are two in number, and freeze in the latter part of winter, and remain frozen till July, while in September the water is represented to be too warm to drink. Mr. Macomber visited one of them in February: it has since fallen in. He found it 6 feet down to the water, which was frozen over so hard that they tried in vain to break the ice with a lead at the end of a line. The wall was covered with ice for some distance up. There seemed to be a current of air blowing laterally in the well, and a candle was extinguished before reaching the ice. The well was dry in the summer time, and at that time the ground was said to be so cold as to render it impossible to work long in it without being warmly clothed. A chain pump was put in one of them, but was soon removed as the ice rendered it useless.

Prof. Guyot alluded to the ice caves in the Jurassic formation in many parts of Europe. He instanced one of these caves about sixty feet deep, whose bottom was always covered with ice several feet in thickness, while stalactites of ice depended from the roof. The whole was a small glacier. The stalactites were formed by water percolating through the covering of the cave; these were situated 3,000 feet above the level of the sea.

Prof. Wm. B. Rodgers had to state similar occurrences in a range of mountains composed of a porous sand rock in Southern Virginia. But he could not see that any accumulation of snow at the bottom of a well should generate ice about its sides.

Prof. Olmstead supposed that there was a current of air circulating through the earth near its surface. In winter it would be below the freezing point, and in the summer it would not melt the ice, as the evaporation would produce a cooling effect.

Dr. Gould alluded to the ordinary method of freezing ice together by mere juxtaposition. It was his fortune to have a friend who was particularly fond on warm days of refreshing himself with a very highly iced beverage, in which the ice was present in small pieces, and sometimes eaten with a spoon. His experience was that pieces of ice frequently adhered to the spoon, and that, too, although the mixture was an alcoholic one.

Prof. Henry said that the fact presented by Dr. Gould was also referred to him by the same gentleman, who was also a friend of his. He repeated the experiment. To produce a perfect experiment it was necessary that all the conditions should be observed. He must therefore give them:—sugar and wine and water were mingled with ice, but instead of depending upon the taste he immersed a thermometer, and observed a reduction. With strong alcohol he obtained a still greater reduction, showing that alcohol has so great an affinity for water that it melts the ice—that this is a freezing mixture.

Prof. Agassiz explained the different kinds of ice. First was that produced by the freezing of the surface of the water and successive layers of water beneath it, a laminated schistose mass. Into this, bubbles from the bottom of the pond were frequently frozen, and when it was subjected to the action of the sun the bubbles became heated, melted the ice around them, and rendered it of no marketable value. It would therefore be worth while for ice gatherers to cover their ponds with cloths, or something which would prevent these bubbles from rising. Glacier ice was formed like pudding stone; compact masses being cemented together so that when you exposed a large lump of glacier ice to the heat of the sun it would crumble to pieces. It was like the decomposition of conglomerate; we had ice-sand. Icebergs could be determined to be derived from glaciers and not to be the frozen surface of the ocean by their conglomerate composition.—Pebbles in glaciers becoming heated, melted the ice beneath them, and quarried their way down to where the heat of the sun could not reach them. The pot holes formed in this way were soon covered with a thin film of ice, but it was only during the protracted cold of winter that they were frozen through.

Prof. Brocklesby could not see the analogy between an ice cave and a well; he did not think the phenomenon had been explained.

BUILDING MATERIALS—Prof. Joseph Henry read a very useful and interesting paper on this subject. He was one of the Commissioners appointed by the Government to examine and test the qualities of marble offered for the Capitol extension at Washington. He gave a detailed account of those experiments. The committee subjected specimens to actual freezing, and after several experiments a good method was obtained. It was found that in ten thousand years one inch would be worn from the blocks by the action of frost. Blocks of 1 1-2 inch cube were subjected to pressure, and thin plates of lead were introduced to equalize any inequalities which might occur in the surfaces. But upon experiment it was found that while one of these cubes would sustain 60,000 lbs. without the lead plates, it would sustain only 30,000 with them. They had therefore to invent a machine to cut the sides of the block perfectly parallel, when it was found that the marble which was chosen for the Capitol, from a quarry in Lee, Massachusetts, would sustain about 25,000 lbs. to the square inch. The manner of its breaking was peculiar. With the lead plates interposed, the sides which were free, first gave way, leaving the pressure on two cones, whose bases joined the plates, and whose apexes met each other, and that they then yielded with comparative ease.

Further experiments were made, perhaps twenty, in order to arrive at definite conclusions. The result arrived at was, that the cube upon solid compression between steel plates of resisting surfaces, sustained fully twice the pressure that it was able to endure when compressed by lead, which possesses a comparatively unresisting tendency.

LOCOMOTIVE AXLES—According to the views he had presented, the difference in tenacity of steel and lead did not consist in the attractive cohesion of the atoms, but in their capability of slipping upon each other. From this view it followed that the form of the material ought to have some effect upon its tenacity, and also that the strength of the article depended in some degree upon the process to which it had been subjected. He had, for instance, found that softer substances, in which the outer atoms had freedom of motion, while the inner ones, by the pressure of those exterior, were more confined, broke unequally, the inner fibres, if he might so call the rows of atoms, gave way first and entirely separated, while the exterior fibers showed but little indications of a change of that kind. If a cylindrical rod of lead, three-fourths of an inch in diameter, were turned down a lathe in one part to about half an inch, and then gradually broken by a force exerted in the direction of its length, it would exhibit a cylindrical hollow along its axis of half an inch in length, and at least a tenth of an inch in diameter. With substances of greater rigidity this effect was less apparent. It existed, however, even in iron, and the interior fibers of a rod of this metal might be entirely separated, while the outer surface presented no appearance of change. From this it would appear that metals should never be elongated by mere stretching, but in all cases by the process of wire drawing or rolling. A wire or bar must always be weakened by a force which permanently increases its length without at the same time compressing it. Another effect of the lateral motion of the atoms of a soft heavy body when acted upon by a percussive force with a hammer of small dimensions, in comparison with the mass of metal, was, that the interior portion of the mass acted as an anvil upon which the exterior portion was expanded so as to make it separate from the middle portions. Prof. Henry exhibited a portion of bar originally four feet long, which had been hammered in that way so as to produce a perforation through the whole length of its axis, rendering it a tube. This fact appeared to him to be of great importance in a practical point of view, as it might be connected with many of the lamentable accidents which had occurred in the breaking of the axles of locomotive engines. These ought in all cases to be formed by rolling, and not with the hammer.

Camphor.

This substance is the produce of the *Laurus camphora* or camphor laurel, of Japan and China. The roots and wood of the tree are chopped up, and boiled with water in an iron vessel, to which an earthern head containing straw is adapted; and the camphor sublimes and condenses upon the straw. In China, the chopped branches are boiled in water till the camphor begins to adhere to the stirrer; the liquor is then strained, and the camphor concretes on standing; it is afterwards mixed with a finely powdered earth, and sublimed from one metallic vessel into another. Two kinds of unrefined or crude camphor are known in commerce, Dutch or Japan camphor, and China camphor. It is chiefly produced in the island of Formosa, and conveyed in junks to Canton, whence the foreign markets are supplied.

Crude camphor very much resembles moist sugar before it is cleaned. It is refined, and converted into the beautiful well-known article sold in the shops, by sublimation. This process is carried on in spheroidal vessels called *bomboloes*. They are made of thin flint glass, and weigh about 1 lb. each, and measure about 12 inches across. Each vessel has a short neck. When filled with crude camphor, they are imbedded in a sand bath, and heated to a temperature of from 250 deg. to 280 deg., which is afterwards raised to between 300 deg. and 400 deg. About 2 per cent. of quick-lime and 2 parts bone-black, in fine powder, are added to the melted camphor, and the heat raised, so as to boil the liquid. The vapor condenses in the upper part of the vessel. As the sublimation proceeds, the hight of the sand around the vessel is diminished. The process is completed in about 40 hours. This operation requires considerable attention and experience. Dr. Ure says:—"If the temperature be raised too slowly, the neck of the bottle might be filled with camphor before the heat had acquired the proper subliming pitch; and if too quickly, the whole contents might be exploded. If the operation be carried on languidly, and the heat of the upper part of the bottle be somewhat under the melting point of camphor, that is to say, a little under 350 deg., the condensed camphor would be snowy, and not sufficiently compact and transparent to be saleable. Occasionally, sudden alternations of temperature cause little jets to be thrown up out of the liquid camphor at the bottom upon the cake formed above, which soil it, and render its resublimation necessary."

The vessels being removed from the sand bath, the mouth is closed with tow, and in this hot state water is sprinkled over them and they crack. When quite cold, the cake of camphor, weighing about eleven pounds, is removed, and trimmed, by paring and scraping into the form of large hemispherical cakes, perforated in the middle. In this process the lime retains the impurities and a portion of the camphor; the latter is recovered by heating the mixture in an iron pot, with a head to it, and the product is refined by a second sublimation.

The factory where camphor is refined has its temperature maintained at about 150 deg., and the atmosphere is generally charged with camphor vapor. The sand baths are therefore heated in baths of fusible metal, kept at a proper temperature from a furnace outside. Each bambolo or flask is covered with a glass shade to prevent the escape of as much vapor as possible, and also to exclude the air, which would render the camphor opaque. There is also an essential oil contained in crude camphor which is driven off before sublimation.

Camphor is a hydrocarbon (C.10, H.8, O.) and as sold by druggists, is a white and semi-transparent solid, of a crystalline fracture, a peculiarly fragrant odor, and a warm, pungent, and somewhat bitterish taste, accompanied by a sense of coldness on the tongue. It is soft and tough, but can be readily pulverized if moistened with a few drops of spirits of wine. It evaporates in the air at ordinary temperatures, and gradually sublimes in close vessels, and attches itself to the surfaces most exposed to the light. If a vessel exhausted of air, and containing a piece of camphor, be exposed to the direct rays of the sun, these crystals will be formed speedily. When small pieces of perfectly clean camphor are allowed to fall upon the surface of pure water, they rotate and move about with great rapidity, sometimes for several hours together; but if, while the camphor is rotating, the surface of the water be touched with a greasy substance (a glass rod dipped in turpentine answers best,) all the floating particles quickly dart back, and are instantly deprived of all motion. The motions of the camphor are accelerated by placing the glass in vacuo. Camphor fuses at 347 deg., and boils at 400 deg., when it may be distilled without decomposition. The density of camphor vapor is 5·27. Camphor is sparingly soluble in water, 1 part of camphor requiring about 1,000 parts of water for solution. This aqueous solution is named camphor julep. It is very soluble in alcohol, ether, acetic acid, sulphuret of caabon, and some other substances. 100 parts of spirits of wine (specific gravity 0·806) dissolve 120 of camphor, forming the camphorated spirit of the Pharmacopœia. On adding water to this, nearly all the camphor is thrown down in a minutely divided state. Considerable use is made of camphor in medicine, both as an internal and an external remedy.

Lima Beans and Sunflowers.

MESSRS. EDITORS—Every body who reads the SCIENTIFIC AMERICAN (and who does not?) understands very well that what you don't know is not worth looking after. In fact, your paper is with us a kind of scientific Bible, a perfect rule of action in all cases, one in which we can confide with the full assurance that we shall never be led astray. But the story in No. 48 of the Lima beans and the sunflowers rather puzzles us "Down Easters," and we respectfully ask you to explain. What we want to know is, whether in case the bean had grown the fastest, the sunflower would not have been the victim, and been pulled up, or whether this method of poling beans belongs to that class of rules that works both ways? Don't think for a moment that we doubt the story—no, indeed! But do tell us how it is done, so that if we try the experiment, we can so manage the process that the bean and the sunflower shall harmonize, and we secure a crop of both.

J. R. M., AND OTHERS.

Bangor, Me., Aug. 11, 1855.

[We recommend our friends to sit on the sunflower by turns, during its growth. This will crowd down or check the too rapid elevation of its stalk, and undoubtedly enable them to harvest both crops with success.—Eds.

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TO CORRESPONDENTS.

M, B., of S. C.—We do not know of any such instruments as you propose. There are dams which will stop the water completely, and which will withstand the strongest freshets Doubtless some that are patented will do so. Making the face of the dam an inclined plane will provide for the passage of fish up stream so long as a small quantity of water runs over; but this plan, we believe was never patented.

J.R.,of Me.—We think it likely there would be some few advantages in having our work published with pages of the size of ordinary books; but only a few of our readers, comparatively, would like such a plan: its present size and form give general satisfaction. Shall be happy to engrave your machine.

J. W. B., of Va.—Monuments of all kinds, for graveyards, made of cast iron, are well known: your plan, therefore, is not patentable; they can be made highly ornamental.

C. C. A., of N. Y.—Your wall fence would probably answer a good purpose; but it is not patentable; neither is your propeller,—the latter you will find illustrated in Vol. 5 (1849) Sci. Am. The effect cannot be greater than the cause: re-action is less powerful than the action.—Look over some book on Natural Philosophy for causes.

T. B., of Ala,—We cannot furnish all the back volumes of the Sci. Am. They are not to be had. It is a matter of doubt which is the best harvester or mower: nearly all those put in market this year have proved good: some persons give McCormick's reaper—price about $160,—and Ketchum's and Allen's mowers—price $100 to $130—the preference. These machines require 2 to 3 horses, and two men, and cut 1 acre per hour.

J. M., of N. J., says: "I can construct a stove that will make its own fire at any desired time in the morning;—would that be considered an invention?" In reply to the foregoing we would state that mere ideas are not patentable. If you have a new mechanical device for accomplishing the purpose you name, probably it could be patented. Send a model or sketch and we will examine it.

C. P., of N. Y.—We will try and give you some information about extracting silver from its ores at some future time. $1 received.

C. S., of Mass.—We cannot furnish you with the book named, on constructing machines; write to A. Hart, Philadelphia.

G. W. T., of N. J.—You can blue your flannels with the sulphate of indigo—chemic—which is made by dissolving ground indigo in good vitriol: 1 pound of indigo to 6 lbs. of vitriol. The back numbers of this volume Sci. Am. will give you good receipts on dyeing.

D. B., of N J.—The apparatus now used on printing presses for "flying," or, in other words, taking the sheets as they issue from the machine, is not patented, we believe, and therefore you can use the same.

C. B. B., of N. Y.—You cannot patent the mere idea of driving a straw cutter by means of belt and treddle; the other portions of your machine you do not sufficiently describe to enable us to determine as to patentability.

J. J, J., of Mass.—A machine for folding cloth after it comes from the loom, has been made. Read carefully Mr. Manly's offer, and our remarks, and you will understand what he wants. The sheet of paper on a printing press must go between the type and the cylinder which gives the impression. When the population of the earth increases to such an extent as to have exhausted all kinds of fuel, it is probable that a company will be formed to run a shaft to the North pole and connect it by means of a pinion, to the earth. In this way a perpetual motion will be transmitted to all parts of the country, and your aspirations will be realized.

D. B. T., of O.—Your seed sower is not new, neither is your plan of sealing cans. $2 received.

E. J. V., of Vt.—Price of covers 50 cents. Send your numbers to this office, and we could have them bound complete for 75 cents.

J. M. T., of Pa.—There is nothing new in your mode of sealing cans.

C. K. N., of N. Y.—You will find an engraving of a wind-mill ship on page 113, Vol. 3, Sci. Am. We never heard that it went ahead far, against the wind, although that was its object. You will perceive that it is furnished with paddle wheels driven by the wind-mill. This is an application of cold air to wheel propulsion, and is just about as valuable as the use of hot for the same purpose.

W. S. T., of Wis.—Forcing air through water to purify it of dust and cinders, on railroad cars, by means of mechanism connected with the wheel axles, is an old idea. No charge for the question. $2 placed to your credit on subscription.

J, R., of C. E.—Use Smee's or Daniell's battery for electro-plating; you will find it very difficult to deposit brass—we never have been able to make it work satisfactorily.

A. W. B., of N. C.—We do not know of any premium offered for welding copper; it will be an invention of some importance if you discover the way to do it.

A. L. D., of Mass.—If you get Brewster's Optics, or Dr. Dick's works, they will give you full explanations for making cameras.

H. H. D., of Ct.—Yours will meet with attention in some future number. Accept our thanks.

J. B., of Va.—Address W. B. Douglas & Co., Middletown, Ct., for Hydraulic Ram; and J. Ball & Co., Jersey City, N. J., for cement pipe. Cannot inform you as to gas pipes.

H. F. T., of N. Y.—An apparatus for raising or lowering the shaft on steamboats, so as to adjust the dip of the wheels at pleasure, would be of some value, provided it worked well & did not interfere with the operation of the engine. We do not remember any practical plan for altering the dip of each wheel independently. $1 received

L. A., of N. Y.—The reason why you notice that so many correspondents are informed that their devices are not novel, is because we more frequently publish the negative replies than the affirmatives. When their inventions are new and patentable we write them by mail, giving details as to further procedure.

Foreign Patents—By the last steamer we received the following foreign patents, which we would thank the owners to order away:—Miller's Machine for making Hir gas: Reed's Oscillating Engine; Loughridge's Car Brake; Hoagland's Treenail Machine; Wallis' Paddle Wheel; Watrous' Machine for making Washers, etc. Chilcott's Fabric (Belgian certificate;) Irving's Paddle Wheel (Belgian certificate.)

We would also again remind our friends that we have a few bushels of American Patents in our possession which we would thank the owners to send for: and at the time of ordering would request their enclosure of postage stamps to pre-pay postage when requested to be sent by mail.

Money received at the Scientific American Office on account of Patent Office business for the week ending Saturday, Aug. 25, 1855:—

G. W. H., of Ct., $55; J. T., of Pa., $25; T. G., of R. I., $25; A. L. B., of Me., $22: H. B. S., of Miss., $30; J. P., of N. C., $50; A. F., of Mass., $30; H. F. P., of N. Y., $60; S. T. P., of N. J., $35; L. S., of N. Y., $10; C. W. B., of O., $20; A. K. C., of Ct., $30; H. S., of Mich., $40; J. W., of Ct., $30; H. L., of Mass., $32; T. C., of N. Y. $30; D. E. T., of N. H., $30; D. H. W., of Mass., $10; D, G., of Pa,, $30; S. G., Jr., of N. Y., $30; V. S., of N. Y., $50; B.,& F., of N. Y., $12; I. C. C., of Mich., $25; P. & W., of N. Y., $10; M. & A., of N. Y., $30; H. W., of Mass., $100; T. G., of N. Y., $30; R. S. P., of N. Y., $30; J. B., of Ill., $25; Z. G. B., of Ill., $30; R. & T., of N. Y. $350; A. H., of N. Y., $100: S. B., of Pa., $5; A. L. F., of Ct., $35; W. B. K., of N. H., $30; C. B., of O., $110; J. P. A., of Ct., $30; A. C. K., of N. Y., $27; H. R., of N. Y., $65; J. C. H., of N. J., $25; R. G. P., of N. J., $25; A. F. A., of Ct., $25; G. W. B., of N. Y., $25: J. B., of N. Y., $87.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, Aug. 25:—

J. C. H., of N. J.; R. G. P., of N. J.; A. F. A., of Ct.; G. W. G., of Mass.; G. W. B., of N. Y.; T. G., of R. I.: J. T., of Pa.; G. W. H., of Ct.; B. & F., of N. Y.; E. B., of Ill.; G. G. T., of N. Y.; I. C. C., of Mich.; J. B. W., of N. Y. (2 cases); A. P. & R., of N. Y. (2 cases); W. & M., of N. Y.; A. C. K., of N. Y.; J. B., of Ill.; C. B., of O. (2 cases); H. N., of Me.

Important Items.

Back Numbers and Volumes—We have the following numbers and volumes of the Scientific American, which we can supply at the annexed prices:—Of Volume 5, 40 numbers, bound, $1,75. Of Volume 6, all,—price in sheets, $2; bound, $2,75. Of Volume 8, none complete, but about 30 numbers in sheets, which will be sold at 50 cents per set. Of Volume 9, bound, $2,75. Of Volume 10, all except Nos. 17, 25, 26, 27, 28, 29, 30, 40, 41, and at the subscription price. Complete Volumes will be ready for delivery in about two weeks. Price $2,75 bound; $2 in sheets.

Missing Numbers—Subscribers who have failed to receive some of the numbers during the year, can have such as we have supplied by stating what numbers are missing at the time of remitting for the new volume.

Patent Claims—Persons desiring the claim of any invention which has been patented within fourteen years, can obtain a copy by addressing a letter to this office, stating the name of the patentee, and enclosing $1 for fees for copying.

Receipts—When money is paid at the office for subscription, a receipt for it will always be given; but when subscribers remit their money by mail, they may consider the arrival of the first paper a bona fide acknowledgment of the receipt of their funds.

Give Intelligible Directions—We often receive letters with money enclosed, requesting the paper sent for the amount of the enclosure but no name of State given, and often with the name of the post office also omitted. Persons should be careful to write their names plainly when they address publishers, and to name the post office at which they wish to receive their paper, and the State in which the post office is located.

Binding—We would suggest to those who desire to have their volumes bound, that they had better send their numbers to this office, and have them executed in a uniform style with their previous volumes. Price of binding 75 cents.

Infallible Rule—It is an established rule of this office to stop sending the paper when the time for which is was prepaid has expired, and the publishers will not deviate from that standing rule in any instance.

Foreign Subscribers—Our Canada and Nova Scotia patrons are solicited to compete with our citizents for the valuable prizes oflered on the next volume. [It is important that all who reside out of the States should remember to send 25 cents additional to the published rates for each yearly subscriber—that amount we are obliged to pre-pay on postage.]

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IMPORTANT TO INVENTORS.

THE UNDERSIGNED having had Ten years' practical experience in soliciting PATENTS in this and foreign countries, beg to give notice that they continue to offer their services to all who may desire to secure Patents at home or abroad.

Over *three thousand* Letters Patent have been issued, whose papers were prepared at this Office, and on an average *fifteen*, or *one-third* of all the Patents issued each week, are on cases which are prepared at our Agency.

An able corps of Engineers, Examiners, Draughtsmen, and Specification writers are in constant employment, which renders us able to prepare applications on the shortest notice, while the experience of a long practice, and facilities which few others possess, we are able to give the most correct counsels to inventors in regard to the patentability of inventions placed before us for examination.

Private consultations respecting the patentability of inventions are held free of charge, with inventors, at our office, from 9 A. M., until 4 P. M. Parties residing at a distance are informed that it is generally unnecessary for them to incur the expense of attending in person, as all the steps necessary to secure a patent can be arranged by letter. A rough sketch and description of the improvement should be first forwarded, which we will examine and give an opinion as to patentability, without charge. Models and fees can be sent with safety from any part of the country by express. In this respect New York is more accessible than any other city in our country.

Circulars of information will be sent free of postage to any one wishing to learn the preliminary steps towards making an application.

In addition to the advantages which the long experience and great success of our firm in obtaining patents present to inventors, they are informed that all inventions patented through our establishment, are noticed, *at the proper time*, in the Scientific American. This paper is read by not less than 100,000 persons every week, and enjoys a very wide spread and substantial influence.

Most of the patents obtained by Americans in foreign countries are secured through us; while it is well known that a very large proportion of all the patents applied for in the U. S., go through our agency.

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American and Foreign Patent Attornies, 128 Fulton street, New York; 32 Essex Strand, London; 29 Boulevard St. Martin, Paris; 6 Rue D'Or Brussels.

WELCH & GRIFFITHS' SAWS—PATENT Ground.—Having purchased from Mr. Wm. Southwell his patent right for grinding circular and other Saws, for which we have paid him a large sum, and we are the sole proprietors of this patent. We will reward any person giving information of infringements on the same. This is the only machine ever invented that will grind a saw perfectly even in thickness. They will require less sett, will not heat while running, will saw smooth, save lumber, and keep an edge longer than another saws made, and are not liable to become untrue. All our Saws are made from an extra quality of cast steel, imported expressly for our own use, at much higher cost than generally used for saws. We respectfully inform all manufacturers of lumber, that no saw will be sent from this establishment but what ss of superior steel and workmanship; the temper will be found more even and uniform than any saw in use. Orders received at our Warehouse, 62 Congress st., Boston. WELCH & GRIFFITHS. 51 6*

BRICK MACHINE, STEAM ENGINE, &c., for Sale—One of F. H. Smith's recently improved patent Brick Machines and Pulverizer, capable of making 20,000 bricks per day. Also one six horse power Steam Engine, upright Tubular Boiler, and gearing complete, made by Pool & Hunt,—all new and in perfect order, having been used for making only about 500,000 bricks, would be sold very low, either together or separately, the present owner being about to relinquish the business, would also sell or lease the yard, with a good supply of clay and sand, kilns, sheds, and all the requisite tools. Address JAMES C. ADAMS, Baltimore, Md. 51 3*

THE NEW BRICK MACHINE has received important improvements this year. The speed is increased to 2,000 per hour—not a brick lost from any difficulty in the slipping—the pulverizer, of the simplest construction, takes the clay as fast as three men can shovel in, at the same time freeing it of stone. The whole is driven by a small portable engine, which cost but $625. A visit to my yard on Locust Point will satisfy any one that it is the cheapest and most efficient mode of making bricks. Price of the machine and pulverizer, $450—a smaller one worked by a horse, which makes 1,000 per hour, $250. For further particulars in a pamphlet giving full instructions on brick burning address FRANCIS H. SMITH, 1* Baltimore.

NOTICE.—LUMBER DEALERS, FARMERS, and others.—A. L. ARCHAMBAULT'S Portable Steam Engines, for driving portable, circular, and up-and-down Saw Mills, Thrashing Machines, &c. Also for loading and discharging cargoes, pile driving, raising materials for Bridges, Buildings, &c. Engines, always on hand, for sale. They are moved on any road by a team, without removing any part of the machinery. Manufactory 15th street, above Willow, Philadelphia. P.S. These Engines have been in use since 1849, and have given general satisfaction. 51 4*

RARE CHANCE FOR AN INVESTMENT—For sixty dollars I will assign my interest in the invention of the Odometer, illustrated in the Scientific American of July 21, 1855, for which I have taken measures to secure a patent for any two states in the Union, Massachusetts excepted. First applicants have the preference, of course. Address F. S. COBURN, Ipswich, Mass. 1*

JUST PUBLISHED—Concise information relative to Patents and Patent Law, designed for the use of inventors and others. Mailed on receipt of two three-cent stamps by JOHN PHIN, C. E., Rochester, N. Y. 1*

A RECEIPT WILL BE SOLD for manufacturing an article to stop its importation from England. Address J. W., box 1952, Philadelphia Post Office. 1*

IMPORTANT TO FRUIT GROWERS, Housekeepers, &c.—The art of Preserving Vegetables and Animal substances, or, New Receipts for Canning and Bottling, Fruits, Vegetables, &c., for $1. Address DAVID LAKE, Smith's Landing, Atlantic Co., N. J. 1*

MECHANICS ATTEND—The Mechanics and inventors of Louisville and vicinity are informed that subscriptions to the Scientific American are received at the Hall of the Kentucky Mechanics Institute, Louisville. M. M. GREEN, Sec'y.

TO MILLERS.—SMUT AND GRAIN SEPARATORS.—Patented Oct. 24, 1854. Warranted superior to any machine for the same purpose in the United States, embracing an entire new feature not before used in any Smut Machine. Mahines sold on trial and fully guaranteed (references expected.) Orders solicited; manufactured and for sale by the inventor, at Uhrichsville, Tuscaroras Co., Ohio. JOHN D. BEDWELL, 51 3*

IMPORTANT TO QUARRYMEN, Stone Cutters, Contractors, and Builders—Porter's Patent Spring Hammer Stone Dressing Machine. The Porter Stone Dressing Machine Co., having purchased the patent for the above invention, are now prepared to sell rights to use the same, and to furnish Machines, and erect them at any place within the United States. This machine may be seen in practical operation at the works of the Company, in the city of New York, on 14th street, between 9th and 10th avenues, where parties interested in the business of working stone, and the public generally, are invited to call and satisfy themselves as to its utility. The Machine is very simple in its construction, and not liable to get out of order. It works with about equal advantage on every kind of stone, and will perform the labor of from twenty-five or fifty men at a total expense of from $8 to $12 per day. It produces a finely finished surface, leaves a perfect arris, and cuts moldings with rapidity and beauty. Its operation is precisely that of the mallet and chisel in the hands of the workman. It combines great power with the nicest delicacy, and has received the uniform and decided approval of practical men. In addition to its regular work, it will be tried on any stone, and subjected to any test, that parties examining it may desire. To those who are unable to visit the Machine personally, a circular with engravings and a full description will be sent on application. Office of the Porter Stone-Dressing Machine Co., 57 Wall st., New York. A. B. CAPWELL, Prest. 47 3eow

JAMES F. STARRETT & SON, Pattern and Model Makers, No. 352 West 27th street, near 11th Avenue, New York. Machine Patterns and Inventors. Models of every description made to order with dispatch. 45 5eow*

STATIONARY STEAM ENGINES FOR SALE—Horizontal Engines with iron bed frames, and Judson's Patent Valves, good, strong, substantial, plain finished, that will do good service, say from 4 horse power, $215, to 30 horse power, $1,037. Pumps, Boilers, and fixtures can also be supplied when needed. Address 28e3wtf S. C. HILLS, 12 Platt st., New York.

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STAFFORD'S HALF HUNDRED RECEIPTS—All new and many invaluable to Inventors or Mechanics. This pamphlet will be sent free of postage, on receipt of 6 cents or two letter stamps, by J. R. STAFFORD, Practical Chemist, 50 4t* No. 22 and 24 New street, N. York.

BULKLEY'S PATENT DRY KILNS, by Super-heated Steam, will dry grain, flour, and meal without scorching, at a cost of 2 cents per bbl. Also green inch lumber in 12 to 20 hours. Circulars sent free on application. H. G. BULKLEY. Kalamazoo, Mich. 49 3*

POLYTECHNIC COLLEGE, of the State of Pennsylvania, West Penn Square, Philadelphia. Organized on the plan of the Industrial Colleges of Continental Europe, and the only College in the Union in which gentlemen graduate in the industrial professions. Third year, commencing Monday, Sept. 17, 1855. Faculty—Mathematics and Engineering, Prof. S. H. Peabody; General and Applied Chemistry, Prof. A. L. Kennedy; Mechanics and Machinery, Prof. H. H. Boucher; Geology, Mineralogy and Mining, Prof. W. S. Rowson; Architectural and Topographical Drawing, Prof. J. Kern; Modern Languages, Prof. V. De Amarelli. For catalogues and further information, apply to A. L. KENNEDY, M.D., President of the Faculty. 50 2t

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THE ARTISAN JOURNAL—A Monthly Record of the progress of Civil and Mechanical Engineering, Steam Navigation, Shipbuilding, and the Industrial Arts, Chemistry, &c. Published in London, and for sale in numbers and volumes by CHAS. H. HASWELL. Consulting and Superintending Engineer, 2 Bowling Green, New York. Drawings and specifications of Steam Machinery, in all its branches, furnished upon application. 14 1amtf

SAWS—PATENT Tempered and Machine-Ground of all kinds; Circular Saws manufactured on these improved principles can be used thinner and with less set, and run faster than any hitherto made. All sizes warranted perfectly even in thickness and temper, and made of the very best material. HENSHAW & CLEMSON, 31 Exchange st., Boston. 49 7*

SAFETY RAILROAD DRAWBRIDGES AND Self-Locking Switches, (Patented.)—This invention will secure to the traveling community perfect safety while journeying on railroads. The apparatus is so arranged that simultaneously with the opening of a draw, switches (on each side of the river) are unlocked and moved to connect with inclined sidelings; and at the same time signals, attached to the switch bars are made to indicate that the draw is open. The self-locking switches can be used separately at any of the turn-outs of a railroad, and thereby prevent the constantly recurring accidents occasioned by neglect of bolting switch levers, as these switches bolt and unbolt themselves when moved by the draw of a bridge or the lever at a turn-out. For the purchase of rights under the patent or inspection of a model, apply to J. K. GAMBLE & BROTHER, No. 5 Margaretta st., near Front, Philadelphia. 49 4*

VENTILATION—The undersigned has devised and patented the only system by which a spontaneous ventilation can be effectually carried out in buildings, vessels, railroad cars, &c., and will sell to parties desirous of purchasing of the same at a reasonable price. Address H. RUTTAN, Coburg Canada. 49 13*

EXHIBITION OF THE MARYLAND INSTITUTE, Baltimore.—The Eight Annual Exhibition by the "Maryland Institute, for the promotion of the Mechanic Arts," will be opened on Tuesday, 2d of October next. Goods will be received for exhibition and competition at any time prior to September 27th, and for exhibition merely, as late as 1st of October. The co-operation of the manufacturers, mechanics, artists, and the community generally is respectfully invoked in the immediate preparation of articles for display. All articles deposited must be of American manufacture; the only exception to this rule being in favor of rare specimens in the department of the Fine Arts, owned by parties not holding them as merchandise on sale. Circulars, embodying the regulations and a rrangements, and blank applications for space, with all other information may be had at any time of the Actuary of the Institute, at the Hall.

JOSHUA VANSANT,
49 4t Chairman of Exhibition Committee.

NORCROSS ROTARY PLANING MACHINE—The Supreme Court of the U. S., at the Term of 1853 and 1854, having decided that the patent granted to Nicholas G. Norcross, of date Feb, 12, 1850, for a Rotary Planing Machine for Planing Boards and Planks is not an infringement of the Woodworth Patent.

Rights to use the N. G. Norcross's patented machine can be purchased on application to N. G. NORCROSS, 208 Broadway, New York.

Office for sale of rights at 208 Broadway, New York. Boston, 27 State street, and Lowell, Mass, 42 6m*

THE EUROPEAN MINING JOURNAL, Railway and Commercial Gazette. A weekly newspaper, forming a complete history of the Commercial and Scientific Progress of Mines and Railways, and a carefully collated Synopsis, with numerous Illustrations, of all New Inventions and Improvements in Mechanics and Civil Engineering. Office 26 Fleet street, London. Price $6,50 per annum. 36tf

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NEW HAVEN MFG. CO.—Machinists' Tools, Iron Planers, Engine and Hand Lathes, Drills, Bolt Cutters, Gear Cutters, Chucks, &c., on hand and finishing. These Tools are of superior quality, and are for sale low for cash or approved paper. For cuts giving full description and prices, address, "New Haven Manufacturing Co." New Haven, Conn. 40 tf

HARRISON'S GRAIN MILLS—Latest Patent.—$1000 reward offered by the patentee for their equal. A supply constantly on hand. Liberal Commissions paid to agents. For further information address New Haven Manufacturing Co., New Haven, Conn., or to S. C. HILLS, our agent, 12 Platt street, New York. 13tf

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Science and Art.

The Art of Dyeing.—No. 36.

DYEING STRAW.—PURPLE—Into a clean copper kettle containing two gallons of boiling water, put four ounces of alum, and about forty drops of the muriate of tin, and boil two hats in this for half an hour, then lift them. Now throw out the liquor in the kettle and put in the same amount of clean hot water, and the clear liquor of half a pound of logwood well boiled. Let the hats now be entered in this and boiled for twenty minutes; then take them out, wash them, and they are done. A little sumac added to the preparing liquor improves the color. For a darker color, add more dye stuffs.

Alkanet root makes a very beautiful light purple color on chip hats. Boil one hat in one gallon of water with six ounces of alkanet root, and half an ounce of alum, for one hour; then lift and wash.

GREEN COLOR—To two gallons of boiling water in a kettle, add two ounces of the extract of indigo, two ounces of alum, one-quarter of an ounce of sugar of lead, and the clear liquor of half a pound of fustic well boiled. Let two hats be boiled in this for twenty minutes, then lifted out and washed. A kind of greenish slate color, sometimes fashionable, is dyed on straw hats, by coloring them a light blue first, with the prussiate of potash and copperas, and then dipping them for fifteen minutes in a weak fustic liquor.

Many dyers use turmeric for dyeing the yellow of their greens on straw, but this is wrong, as this color cannot stand exposure for more than a few hours to bright sunlight. Fustic, therefore is the best coloring material for the yellow of straw hats dyed green. Ebony is also good, but is too expensive.

YELLOW—Straw can be dyed a beautiful yellow with the bichromate of potash and lead. The straw is handled for about fifteen minutes, in a warm liquor containing three ounces of sugar of lead dissolved, then lifted aud introduced into another warm liquor containing one ounce of the prussiate of potash dissolved, and in which it is handled for ten or fifteen minutes. These quantities of dye stuffs will dye one pound of straw. We have never seen yellow straw hats, but no one can account for fashionable taste—such hats may yet adorn the heads of our gay belles.

MAROON AND CRIMSON—Into a clean kettle containing four gallons of hot water, near the boiling point, add four ounces of alum, a wine glass full of the muriate of tin, and two ounces of sumac. Handle three straw hats in this for half an hour; then lift them, cool, and rinse in six gallons of clean cold water. Clean out the kettle, and put into it four gallons of hot water, and the liquor of one pound of peachwood well boiled, and four ounces of logwood; handle the hats in this at a scalding heat for one hour, and they will be a maroon. With one half the quantity of logwood, they will be a crimson. Dark colored straw bonnets must be washed well in cold water before they are dried.

Cudbear dyes a number of beautiful shades of ruby color. Take one pound of cudbear and place it in a vessel containing four gallons of water, and one ounce of soda, and boil three hats in it for half an hour, then take them out and they will be a beautiful color.

The size that is used for stiffening colored straw hats, is white glue. It is dissolved in hot water, then suffered to cool before it is used. It is better to dip the hats in a solution of this size, than to rub it on as some do, with a sponge. Black straw hats should be dipped into a hot solution of glue, for stiffening; it takes away all the brownish appearance of an excess of logwood, and leaves them a shining jet color. Gum arabic kept dissolved in a bottle, is put on black straw hats with a sponge after they are pressed, to give them a glossy appearance.

Railroad Drawbridge.

The accompanying engravings are views illustrating the improved railroad drawbridge, for which a patent was granted to J. K. and W. P. Gamble, of Philadelphia, on the 7th of last May.

Fig. 1 is a plan view of the drawbridge partly open, and showing the main and branch tracks and the switch rails, and the main track connected with the branch inclined tracks by the switch rails. Fig. 2 is a vertical longitudinal section, and fig. 3 is a vertical transverse section through line *x x*, fig. 1. Similar letters refer to like parts.

GAMBLE'S RAILROAD DRAWBRIDGE.

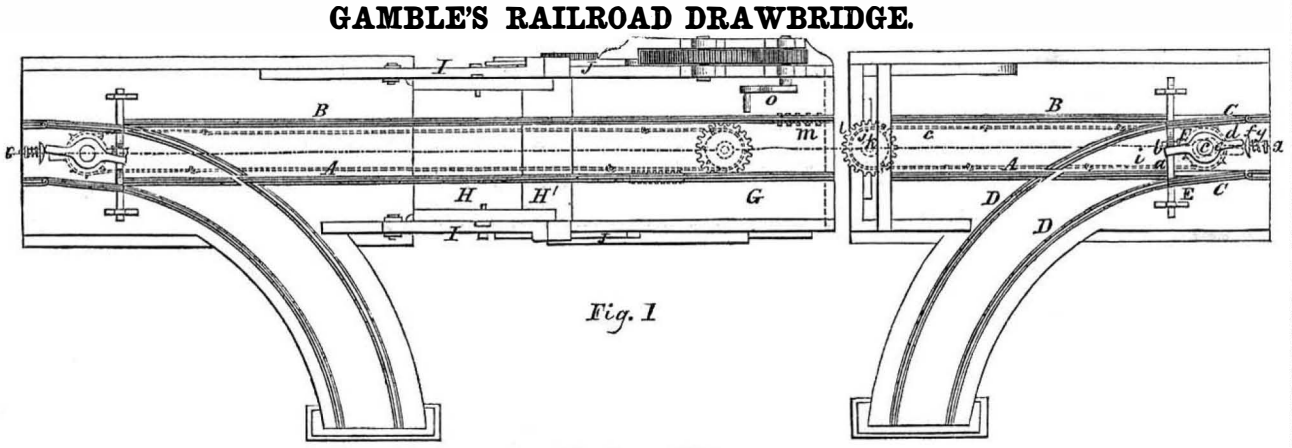

Fig. 1

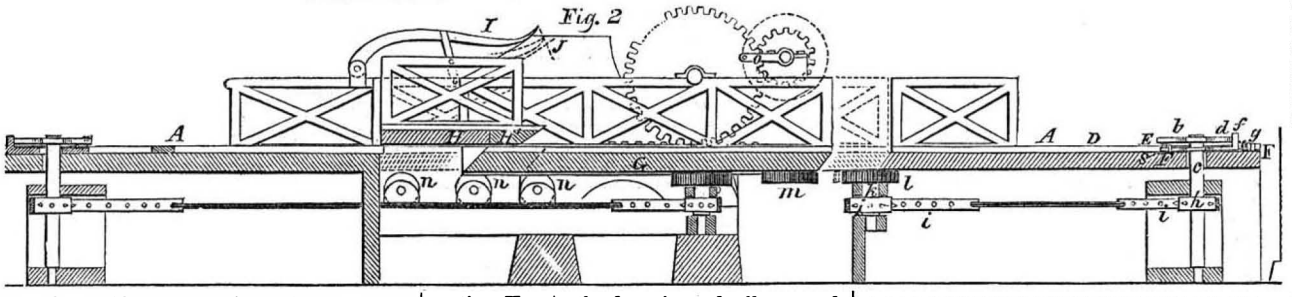

Fig. 2

A B represents the main track passing over the bridge. C C are the switch rails placed on both sides of the river at about one hundred yards from the ends of the bridge. D D, in figure 1, are the safety inclined branch tracks with which the switches, C C, connect when the draw of the bridge is open. The switch bar, E, has a notch, *a*, cut in its top, in which a shifting arm, *b*, fits. This arm is secured in a revolving vertical shaft, *c*.—There is another arm, *d*, similar to *b*, secured in the same shaft. F is the bolt for locking the switch bar for a given time. It is made broad at its center, and has a flat slot, *e*, cut in it, in which shaft *c* plays, as the bolt is locked or unlocked. On the outer end of bolt F, a cam, *f*, is secured, which serves to draw the bolt out of its connection with the switch bar, either when the switch is in line with the branch track or the main track. The spiral spring, *g*, on the end of the bolt, is for throwing the bolt into connection with the switch bar at the time required. *h* is a chain wheel on the shaft, *c*, and *i* is a chain passing around it, connecting it with the chain wheel, *j* fig. 2. On shaft, *k*, a cogwheel, *l*, is secured, which turns with the shaft, and is operated by rack *m*, which is on the bottom of the draw. This wheel and the rack bar are so situated that they do not operate until the draw is nearly closed, or as it just commences to open. The arrangements described for locking and unlocking the switch is the same for both ends of the bridge, and the description of one answers for the other—both are operated at the same time by the movement of the draw. G is the draw which is moved back and forth horizontally over the friction rollers, *n n n*, and under the swinging portion, H. As the draw is gradually opened the levers, I I, are made to lift the part, H, as it (the draw) is forced under it. The loose ends of these levers are made to move upon inclined ways, J J, which are attached to the draw, G, and consequently lift the swinging portion sufficiently high to allow the draw to pass under. The cogged gearing, as shown in fig. 1, by the large wheel taking into the rack on the draw, moves it back and forth. As the draw, G, is opened, it does not lift the part, H, at first, but moves under the hinged portion after the switches have been shifted to the branch track, and then commences to lift the part H. The object of this is, that the draw cannot be opened the smallest distance before the switches are changed. As the draw closes, the swinging part, H, descends, and occupies its proper position, for as the inclined ways, J J, are moved from the lifting levers, the latter are caused to descend the inclines, and allow the draw to occupy its position, and thus all the parts are self-adjusting.

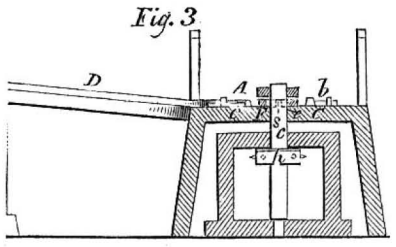

Fig. 3

OPERATION—By turning the crank, *o*, the cog gearing will be set in operation when the draw will commence to move horizontally, and to open gradually. As soon as the draw commences to move, the teeth of the rack, *m*, will take into the cog wheel, *l*, and cause it and the shaft, *k*, to turn and give motion to the band or chain, *i*, and to the wheel, *h*, and shaft, *c*. As soon as the shaft, *c*, commences to turn, the shifting arms, *b*. and *d*, are operated. The arm *d* being made to turn slightly and bear rigidly against the cam, *f*, which is secured fast on the bolt, F, and compresses the spiral spring, *g*, and forces the cam outward sufficiently far to draw the bolt from its connection with the switch bar. As the bolt is withdrawn from one of the two holes, *t*, in the switch bar, the arm, *b*, is made to bear on the side of the notch, *a*, in the switch bar, and force the said bar to another position, and cause it to throw the switch rail in connection with the branch track; as soon as this takes place, the arm, *d*, escapes by the cam, *f*, and the bolt is again forced by the spring into the other hole, *t*, in the switch bar, and made to lock the switch for a given time. To shift the switches from the main to the branch track, the draw is opened but very slightly. After the switches are thrown in connection with the branch track, the draw may be opened its full width without the least danger of the cars running into the water, as they will pass up the steep inclined branch track, when their progress will be arrested, and they can then descend again and remain stationary until the draw is closed.

Signal poles 20 feet high are also placed on each side of the road opposite the switch bars. These have colored indicators on the top for day signals, and two deadened sides and one clear side in the lantern for night signals.—These are operated simultaneously with the draw and switches, so that every means for safety are brought into requisition. For more information see advertising columns.

The object of this improvement is to prevent such accidents as occurred at Norwalk, Ct., two years since, by the cars running through the open drawbridge into the river, whereby a number of valuable lives were lost. The nature of the invention consists in a self adjusting means to be hereafter described, for operating and arranging switch rails with a side steep inclined track at each end of the bridge, and with the main track, whereby the switch rails are made to connect with side inclined tracks, simultaneously with the slightest opening of the draw, and then to shift and close the main track over the draw when the latter is perfectly closed, thus locking and shifting the switches by the slightest motion of the draw. Thus, if a train be running towards the bridge, the draw being open and no signal seen, it cannot run into the water through the gap, but will run up the inclined side branch track, and its progress be arrested.

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